ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS

25c a Copy

NOV.
1939

McGraw-Hill Co.
of Calif.

ELECTRIC COOKING COSTS NO MORE
Switch To Modern Electric Cooking Now
it's fast—A modern electric range cooks as fast as food will cook. It saves time, gives you extra hours of leisure. The automatic control "tends" while you are away.
clean—Electric heat is clean heat. Pots and pans stay bright, kitchen walls stay clean longer. And it's no trick at all to keep the range itself spotless.
and cool, too—Extra thick insulation keeps the heat in the oven and out of the room. Enjoy a comfortable kitchen—switch to cool, economical electric cooking now.
Edison
SEE THE NEW ELECTRIC RANGES AT YOUR DEALER'S STORE OR EDISON OFFICE
ELECTRIC COOKING IS CLEAN
Switch To Modern Electric Cooking Now
and economical—Electric cooking costs no more than other methods. An electric range gives you the benefit of Edison's low domestic cooking rate, reducing the average cost of all electricity you use.
and cool—You'll enjoy new, comfortable coolness in your kitchen with a modern electric range. Extra-thick oven insulation keeps the heat in the oven where it belongs.
and fast, too—Cooking is a "snap"—with a modern electric range. All you do is put the food on to cook—the automatic control "tends" your cooking while you do other things. Electricity cooks fast.
Edison
SEE THE NEW ELECTRIC RANGES AT YOUR DEALER'S STORE OR EDISON OFFICE
ELECTRIC COOKING IS FAST
Switch To Modern Electric Cooking Now
clean, too—Electric heat is as clean as sunshine. Pots and pans stay bright. Kitchen walls, woodwork and curtains stay clean longer. And it's no trick at all to keep the range itself spotless.
cool, too—Electric cooking is so easy, so cool. Extra thick insulation keeps the heat in the oven and out of the room. You'll enjoy new, comfortable cooking with an electric range.
economical, too—When you install an electric range you receive the benefit of Edison's low domestic cooking rate. Electric cooking costs no more than other methods—switch to fast, economical electric cooking now.
Edison
SEE THE NEW ELECTRIC RANGES AT YOUR DEALER'S STORE OR EDISON OFFICE
TELLING THE Selling STORY OF MODERN ELECTRIC COOKING
Week after week Edison electric range advertising tells the women of central and southern California the selling story of modern electric cooking: "Electric cooking is COOL." "Electric cooking is FAST." "With all its advantages, electric cooking COSTS NO MORE." "Switch to modern electric cooking NOW." That is why, and how, Edison promotion keeps potential range buyers continually aware of the advantages of electric cooking, and builds good prospects for every aggressive electric range dealer in Edison territory.
SOUTHERN CALIFORNIA EDISON COMPANY LTD.
11-39

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), November, 1939, Vol 83, No. 5. Published monthly by the McGraw-Hill Company of California, 68 Post Street, San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shillings). Single copy 25c.
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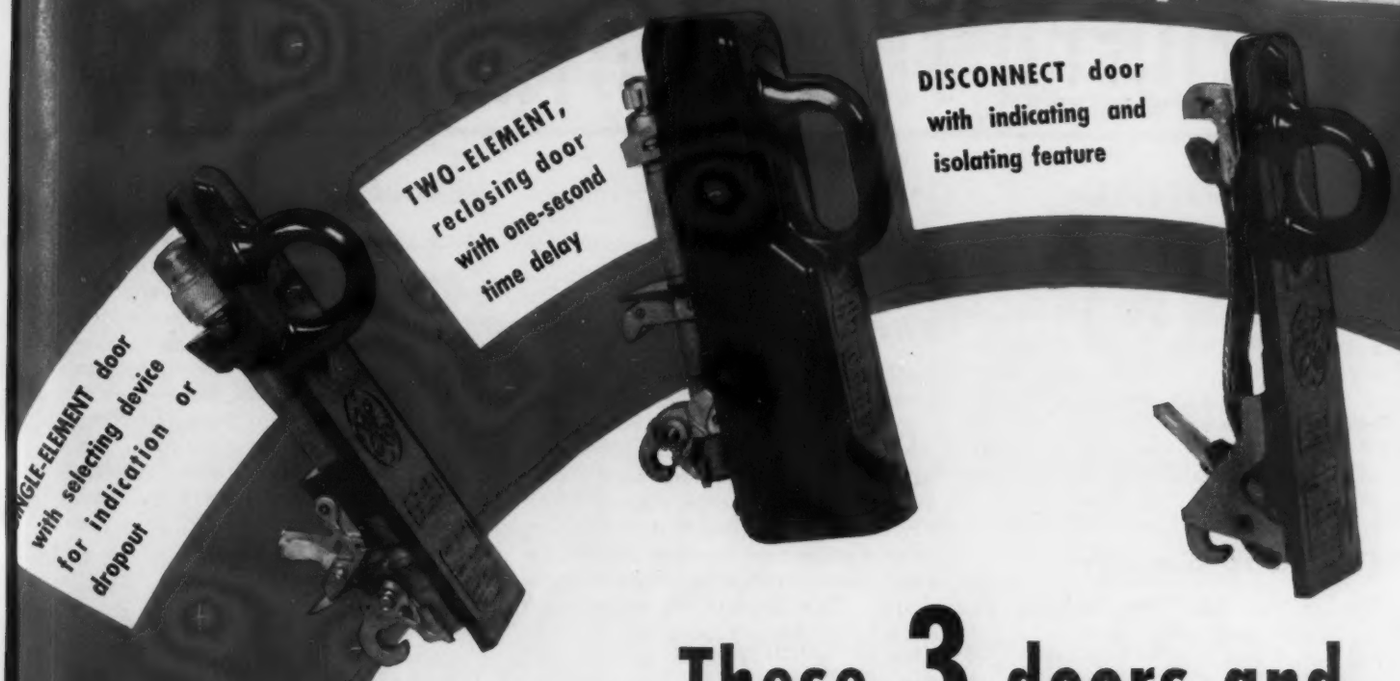
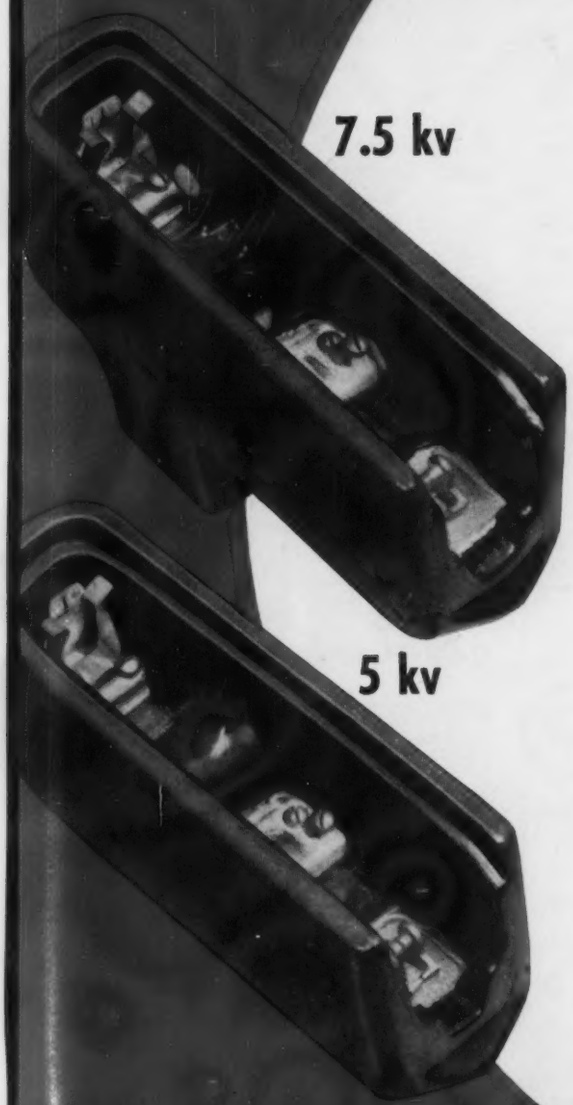
How many different cutouts do you carry?

PRINT IN BINDING


NGLE-ELEMENT door with selecting device for indication or dropout
TWO-ELEMENT, reclosing door with one-second time delay
DISCONNECT door with indicating and isolating feature



These 3 doors and these 2 housings . . .

meet 80% of your cutout requirements

IF you are looking for an opportunity to cut costs through lower inventories, fewer parts to handle in the stock room, and greater flexibility of cutout application, then we have a message for you.

It's this: You can take care of 80 per cent of your distribution fuse cutout requirements with just five major parts.

And the best of it is that you can adopt this simple program very easily. You don't have to stock all five of these parts immediately. Here's the way you do it:

First: You buy our 50-amp indicating and dropout fuse cutout in the 5- and 7.5-kv ratings. (Perhaps you're doing that now.) This gives you two housings to take care of all voltages not exceeding 8 kv (13.2 kv, Gr Y) across any one cutout. The doors are identical and interchangeable.

Suppose you are ready to use reclosing cutouts at sectionalizing points, on branch circuits, or at transformers serving important customers or located in out-of-the-way places. You have already installed G-E indicating and dropout cutouts. All you do is to take a G-E two-element *reclosing door* and send out a trouble crew to change doors. No line crew required. No installation costs. And it's the lowest cost, expulsion type.

What about disconnects? Simply take our new-design disconnect door. This, too, fits both housings. Furthermore, it has an indicating and isolating feature that saves time and makes for greater safety.

Two housings and three types of doors. General Electric is the only manufacturer that offers this stock-reducing, money-saving combination. Why not look into it today? General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

340-39

BETWEEN THIS MONTH'S COVERS

Headaches

TAXES RAISE THE ROOF (p. 20). A prominent electrical contractor has real words to say about why building costs are high. And he goes ahead to suggest a few remedies, after first outlining the governments present means and ways of taxing those who participate in the building profession. When you've read this article, you'll see why so many other industries, and you yourself, are affected.

Counting Kw.-Hr.

METERS (p. 22): Standardizing on equipment, particularly on a meter for residential use that will meter everything from an insignificant trickle of energy up to peak demand of a highly elecirified modern home, and maintain accuracy all the way, is one endeavor that's afoot today. The 15- amp. meter seems favored. Many metering trends become headaches for Westerners because of local characteristics.

No Thumbs on the Scales

TEST PERIODS VS. METER ACCURACIES (p. 24): How often should meters be tested? George Searle, of PG and E, has undertaken to demonstrate to PCEA that on the basis of their own data on some 26,000 meters, money spent for testing meters at any interval whatever would never be regained by the company, hence by the customer, or by anybody else. However, some other factor, like public relations, might be the deciding one. Two othr PCEA reports indicate these subjects to be currently important: standardizing on a size of meter, metering loads wherein demand is intermittent, the wave distorted or the power factor bad. It is felt none of these will introduce sizable metering errors, however. Both are on p. 26.

Buy in a Package

COSTS OF UNIT SUBSTATIONS (p. 29): A year ago ELECTRICAL WEST reported on installation of a unit substation at Felton, on the Coast Counties system. F. D. Beardsley of that company this year presented a PCEA paper on that and other unit equipments. The parts that read in $$$ are abstracted. The author says that although cost of the unit may figure higher than that of equivalent conventional equipment, there are a number of incidental savings hich may make the package type cheapest in the long run.

Through the Back-door

SHORT CUTS TO KITCHEN PLANNING (p. 30). The Valley Electric Supply Co., merchandising and cooperative subsidiary for the San Joaquin Power Division, PG and E, carries on a unique promotion in its kitchen planning service. It is so successful that it has been given a prominent location in the company's headquarters. Lawrence King, in charge of the department can turn out a complete kitchen plan in about an hour and a half. He uses gadgets, and tricky substitutes in his drawing tools. But through the results of this equipment and his knowledge of what a real kitchen should be, the utility is selling its five major services to many home-minded and home-planning customers.

Forward March

PCEA LONG BEACH SESSIONS SHOW INDUSTRY IS ALERT (p. 39). A summary of the annual southern fall conclave of the PCEA is given, covering sixteen discussion groups. Topics on lighting. wiring power, small appliances and heavy duty appliances, air conditioning, petroleum electrification comprised the business development section, together with an interesting paper by Shirley Douglass, foods editor of *Sunset* magazine. The Oakland meeting is also reported summarized section by section.

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Cover: With the camera pointed south, this interesting picture of a lineman was taken in the Hood River Valley, where rural electrification began 33 years ago

School Daze?

SCIENCE OF SEEING IS AID TO BETTER SIGHT IN SCHOOLS (p. 44). During the last few years Clark Baker and his assistant in the PCEB have been asking a lot of questions themselves and asking for a lot of questions in return from teachers throughout California—queries about the eyesight of pupils, about proper lighting in the schoolroom, etc. From more than 300 of these, 120 were chosen to be answered fully and with one object in mind—better sight for school children.

New Bulbs For Books

BEFORE — AND AFTER (p. 46). Portland's Public Library decided one day to modernize the lighting in several of their large rooms. The results were amazing, but certainly pleasing to both authorities and those who patronized the building, because the rooms at night took on a shadowless daylight quality. Adequate wiring played an important part in the new installations.

Investment

MODERN BLACKSMITHING (p. 48). No machinery stands idle on the 310-acre farm of Gus Krause near Hillsboro, Ore. A new modern "blacksmith" shop, electrically operated, keeps things humming along in good order. Krause has $10,000 invested in farm machinery. No wonder he's careful about this equipment of his. It means the difference between success and failure.

So It Goes

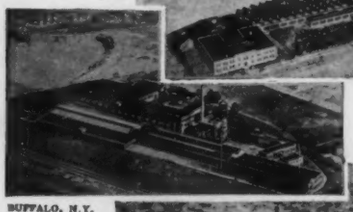
NEWS OF THE INDUSTRY (p. 52). City of Sedro Woolley, Wash. continues its fight against the Skagit PUD. . . . Slattery, new REA administrator, calls new Washington Water Power project a blow to rural electrification in the Inland Empire . . . Nevada-Calif. Power wins national safety award for second time . . . Dr. Raver signs first contract for Bonneville power with the Pacific County PUD . . . superintendents of municipal power plants in Washington oppose state regulation of municipal utilities . . . Sickler appointed new rate head at Bonneville . . . Southern California Edison names new department heads . . .

A Statement of Position and of Policy

BAYONNE, N.J.

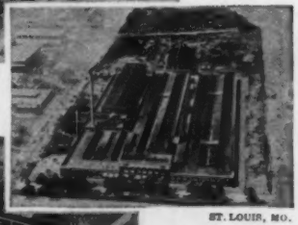
PERTH AMBOY, N.J.

ROME, N.Y.



BUFFALO, N.Y.

PAWTUCKET, R.I.



ST. LOUIS, MO.

EMERYVILLE, CAL.

BALTIMORE, MD.

LOS ANGELES, CAL.

With capacity demands on the production machinery of the wire and cable industry, General Cable finds itself in a strong position through multiple plants and exceptionally large manufacturing facilities.

As a matter of practice and policy it is protecting in every way possible its scheduled deliveries to those who look to General Cable for their normal needs.

In the handling of the surge of extra demand it proposes to follow the same policy, tempered only by priorities which must be recognized—and understood.

EMERYVILLE PLANT

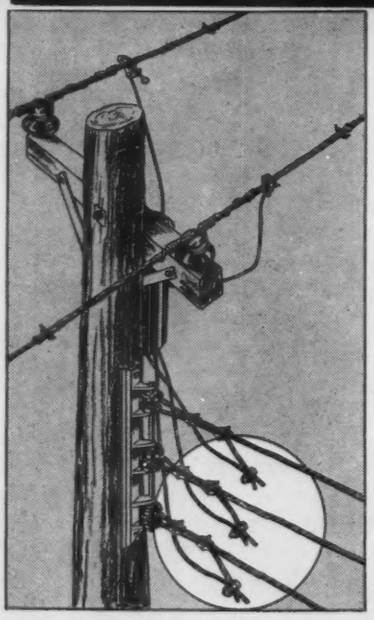
LOS ANGELES PLANT

SERVING THE PACIFIC COAST

GENERAL CABLE

General Cable Corporation Sales Offices: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT KANSAS CITY (MO.) • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROME (N.Y.) • ST. LOUIS • SAN FRANCISCO • SEATTLE • WASHINGTON (D.C.)

modernize
YOUR
DISTRIBUTION
PRACTICE—



Rural line transformer pole with a secondary span to a yard pole.

RELIABLE
SOLDERLESS
CONNECTORS

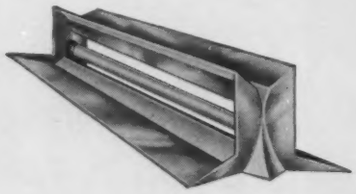
Split bolt connectors have become standard in the industry. Reliable Electric offers well designed types for all applications. Shown above are aluminum to copper connectors which provide adequate spacing between the red and white wires to avoid galvanic corrosion.

Reliable
ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES

NEW PRODUCTS

Fluoflectors (1101)

New fluorescent lamps are a very useful tool for better lighting of show cases. Edwin F. Guth Co. has a new line of show case fluoflectors that produce with fluorescent lamps, a perfect daylight color, plus "cold-light" and low wattage characteristics. Units



are available with housings of bronze or steel. A separate inner reflector, made of aluminum, is of processed Alzak.

Bells (1102)

"Connectabell" is a new type of alarm and signal bell, featuring Alnico-magnet motor and bayonet type connection, and developed by the Connecticut Telephone & Electric Corp. The striking mechanism has been greatly simplified and contains only one moving unit —the striking plunger itself. The motor is small and compact, completely enclosed and air-sealed. The bell can be mounted easily and quickly on standard outlet boxes. It is designed for high voltage, either a.c. or d.c., but is also made for low-voltage systems.

Cover Gloves (1103)

Made to give a better fit, better grip, without rips—is a new cover glove introduced by Merit Glove Co., to be worn over the lineman's rubber glove. Claimed to be the first cover glove on the market that follows the contours of the underlying rubber glove, it is made of imported goatskin which insures pliability and durability under all weather

conditions. The fingers are long enough to comfortably cover the rubber fingers and insure maximum wear. The seamless and reinforced thumb eliminates rips and gives a sure grip.

For Your
PROTECTION

Blackburn Connectors

are made completely of Duronze actually stronger than steel. They will not stretch and loosen. They will not season crack or corrode. In short—Blackburn Connectors are your protection against faulty joints.

JASPER BLACKBURN
PRODUCTS CORP.
Main and Clinton Sts. St. Louis, Mo.

TELESCOPE BM SYSTEM

CONNECTORS
AND
COUPLINGS
Cadmium Finish
for Electrical Metallic Tubing

B-M Connectors and Couplings make the neatest installations. No nuts to tighten, just two squeezes with our Indenter and the fitting is securely fastened to the tubing.

B-M fittings are so much lower in price that the savings on the first job will more than pay for the Indenter required. Our tools and method of fastening the fittings to the tubing are patented, and we limit the license of our tools under these patents to the installation of our fittings only.

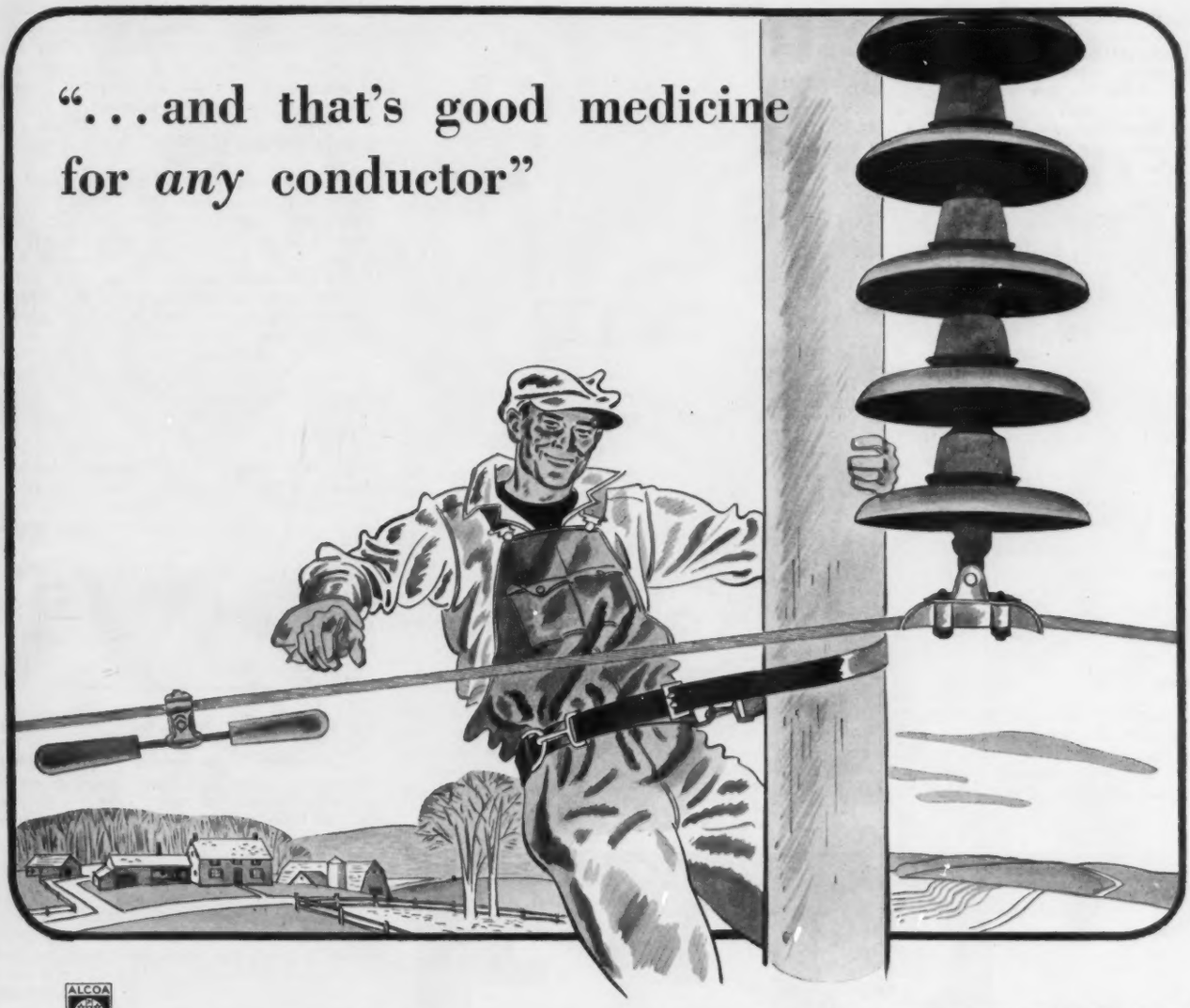
Listed by Underwriters

No. 605. Price $1.35

DISTRIBUTED BY:
THE M. B. AUSTIN CO., Chicago, Illinois
CLAYTON MARK & CO., Evanston, Illinois
CLIFTON CONDUIT CO., New York City
GENERAL ELECTRIC CO., Bridgeport, Conn.
THE STEELDUCT CO., Youngstown, Ohio
TRIANGLE CONDUIT & CABLE CO., Elmhurst, New York City
ENAMELED METALS CO., Pittsburgh, Pa.
NATIONAL ENAMELING & MFG. CO., Pittsburgh, Pa.

BRIEGEL METHOD TOOL CO.
GALVA, ILLINOIS

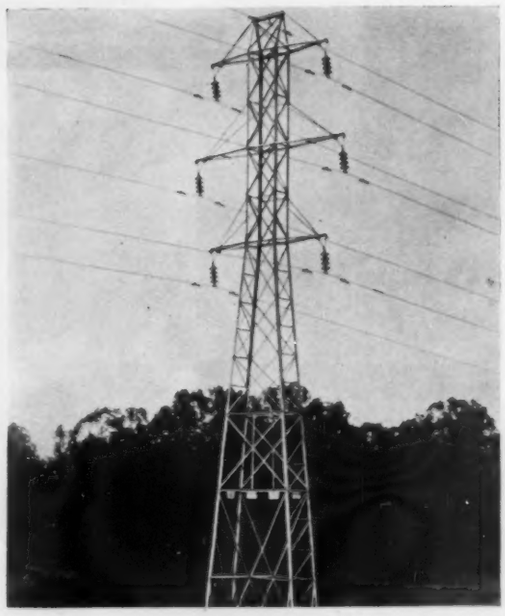
"...and that's good medicine for *any* conductor"



"With conditions right, Mister, any wire'll get the urge to start vibrating. No matter *what* it's made of! Our business is to see that no harm comes to that line, ever."

Vibration control is an important part of the engineering recommendations offered by Alcoa engineers. The Stockbridge vibration damper has solved this problem so nicely that, today, you'll find it at work on *every* kind of conductor and overhead ground wire material. Providing valuable protection at small cost.

Build with A. C. S. R. conductors, following A. C. S. R. standards, and you'll have the finest possible construction. Over 700,000 miles, on both high and low voltage lines, have proved the dependability of A. C. S. R. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Bldg., Pittsburgh, Pa.



A·C·S·R

Aluminum Cable Steel Reinforced

FOR RURAL LINES AND POWER TRANSMISSION

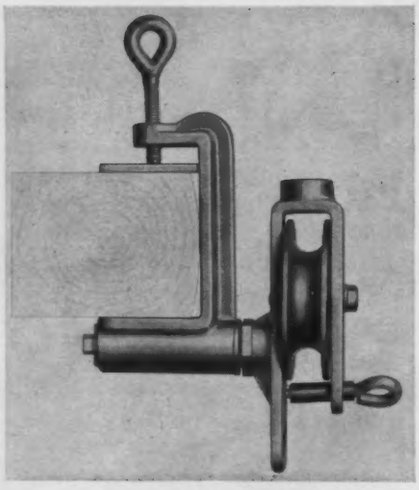
Speed Motor (1104)

Incorporating an entirely new principle in alternating current adjustable speed motors, Louis Allis Co. has developed an Adjusto-Spede motor that also has many new advantages heretofore not available in a.c. adjustable speed units. The new motor is a combination of an eddy current clutch and a

standard constant speed a.c. squirrel cage motor. It has an unusually wide range of speed variation from zero to full speed at full load torque, and can be operated continually at low speeds without overheating. Remote control available as standard at slight cost. Uses for this type of motor are numerous. A few applications include printing presses, textile machinery, grinders, glass machines, paper machines, feed and working drives on machine tools, wire drawing machinery, printing and rolling equipment, tension drives.

Pulley (1105)

A new wire stringing pulley that prevents conductor damage, saves time in stringing, has been developed by the Line Material Co. Since this pulley mounts on top of the cross arm instead of being suspended below it, the



wire is in better position to be placed on the insulator. It also reduces friction. The unit has two positions, one for straight runs and one for angle runs.

Switches (1106)

A new line of indoor disconnecting switches for hookstick or group operation has been announced by Westinghouse. The new switches are available in ratings of from 200 to 6,000 amp. for 5,000-volt service, and in sizes ranging from 400 to 6,000 amp. for 7,500 to 34,500-volt service. To increase the ease of operating the new switches, the operating eye and blade latch have been designed to produce a cam or pry-out action, which completely disengages the blades from the tongue member. Switch blades are made of hard drawn copper of high conductivity, arranged in a parallel-path design, so that during a short circuit the magnetic force between blades increases contact pressure.

Steam Heater (1107)

Now you can plug in a light socket and produce steam heat. The "Noral" Electric steam unit heater, developed by the Knoral Electric Mfg. Co., is a 1000-watt self contained steam plant. Motor driven, it forces billows of steam heated air to every part of a room area, and maintains a 75° temperature in severest weather. No oil to pour, no flues to adjust, and it does not destroy oxygen content of the room. The unit is constructed of heavy gauge steel, finished in attractive non-chipping enamel.

Jumpers (1108)

Flexible copper braid jumpers, made by Burndy Engineering Co., are suitable for carrying instantaneous currents up to 30,000 amp. such as may be used in heavy welding

equipment. The inner ends of the copper ferrules are belled to prevent excessive stress concentration in the strands as they leave the ferrules. Curved or straight braid assemblies with the ends compressed into a solid mass in the ferrules have been made for any ampere capacity desired.

Starter (1109)

A new fluorescent lamp starter and a current-limiting device known as the fluorescent lamp ballast have been introduced by Westinghouse. The starter is located in a special socket attached to a standard fluorescent lamp holder by a single screw. The ballast may be mounted in any convenient place and are available for single and two-lamp operation. Heart of the new starter is the glow switch, a small glass relay tube containing a bimetallic switch and an easily ionized gas. Resultant heat causes the contacts to close.

Ceiling Switches (1110)

A complete line of bottom and side pull ceiling switches has been made available by Arrow-Hart & Hegeman Electric Co. With attractive black Bakelite covers fastened to switch by one convenient screw center, these units include single pole, double pole, three way, four way and electrolier, also internal and back connected switches assembled to 3¼″ and 4″ outlet box covers. They are rated up to 10 amp., 125 volts; 5 amp., 250 volts.

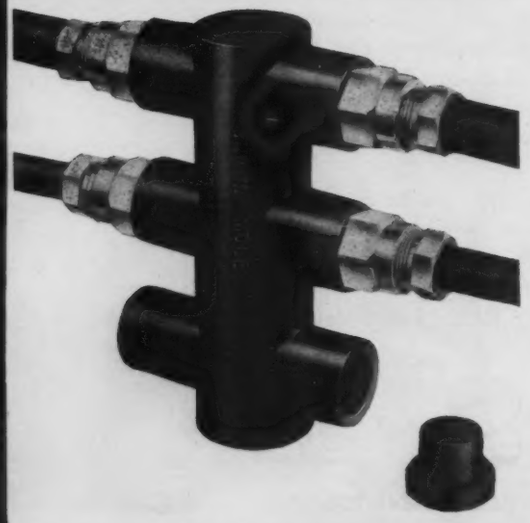
Varmeter (1111)

Without extensive wiring, expensive equipment, or cutting into the line, a new General Electric portable varmeter permits quick determination of current up to 300 amp., of line volts, and of reactive kva on power lines. It is simple to operate, and a lineman can clamp the 12-lb. instrument on the line, connect the voltage dividers, and obtain readings of volts, amperes and vars by the operation of a selector switch. Scale illumination assures accurate readings in poor light or at night.

MOLE

BURNDY INSULATED MULTIPLE TAP CONNECTOR FOR UNDERGROUND DISTRIBUTION

Type ZM, made in a wide variety of sizes, shapes and ampere capacities; fully described in Bulletin No. 787. Write for it.



BURNDY ENGINEERING CO., INC., 459 E. 133rd St., N. Y. C.

"ILLINOIS PORCELAIN

PROVED TO BE THE IDEAL ANSWER FOR THAT LAST IMPORTANT JOB—

LET'S PROFIT THRU EXPERIENCE AND

STANDARDIZE ON ILLINOIS"

When you see Illinois Porcelain used on today's most modern electrical equipment you know that the DIMENSIONS are EXACT — this is always true whether the quantity ordered was a few or many. You can be sure of HIGH MECHANICAL STRENGTH in every piece—this is a result of high quality materials and a specialized process of manufacture.

Some of the reasons why you get exceptional performance value

- No variations in the original material mix because of full operation control which assures uniformity.
- Internal air pockets are eliminated by vacuum type pugg mill.
- Dimensional perfection assured through profile control which guarantees uniform contour of all pieces.
- Pleasing exterior appearance through completely controlled glaze mix.
- Strains in porcelain are prevented by scientifically controlled firing in tunnel kiln. Accurate instrument control record is kept during entire firing of every car of porcelain.

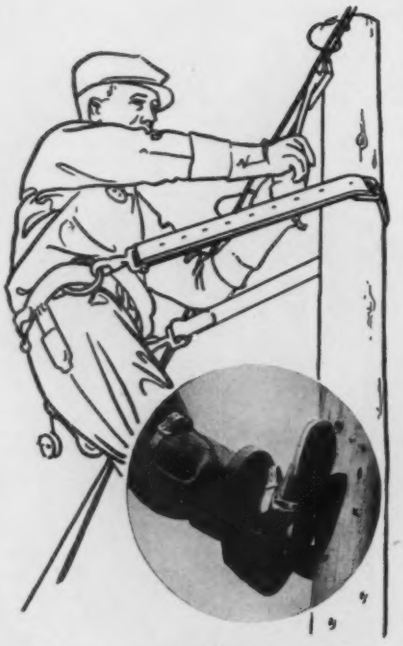
Standardize on

ILLINOIS

FOR TOP QUALITY AND EXACT DIMENSIONS——

ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS

THE HENGER-SELTZER COMPANY, LOS ANGELES, CALIFORNIA IS READY TO SERVE YOU



How to be sure your climbers are SAFE

With climbers as with other equipment for the lineman there can be no compromise with safety. Kleins are the result of 82 years' experience. Special steels—individual tempering and testing—rigid supervision—assure uniform performance and maximum satisfaction, safety, and over-all economy.

Be sure of safe CLIMBERS. Look for the name—

● Klein's New Lightweight Climbers

● Write for the Klein Pocket Tool Guide

Mathias KLEIN & Sons
Established 1857 Chicago, Ill. U.S.A.
3200 Belmont Avenue, Chicago, Illinois

Steelite (1112)

A heavy-duty, extremely rugged lighting unit is the new Benjamin Electric Mfg. Co. "Steelite," armor-clad with a steel housing above and "Herculite" heat, cold and impact resistant glass below. Dust tight and vapor proof, the reflector interior is positively

sealed against dirt. The "Steelite" is ideally suited for lighting in steel mills, foundries, forge shops, wire mills, stamping mills and cement and chemical plants.

Brascolite (1113)

A new lighting fixture introduced by the Edwin F. Guth Co. is a successor to the Brascolite. The new unit embodies similar lighting principles as of the old Brascolite,

plus modern design and new features. It is a 100% aluminum fixture with an Alzak finish that does not chip, peel, tarnish or discolor.

Transformer (1114)

To meet the demand for a smaller outdoor current transformer, General Electric offers for the first time a 15-kv. Pyranol-filled outdoor current transformer of the porcelain-shell type. Adaptable for either horizontal or vertical mounting, the new transformer meets the NEMA accuracy classification of ¼X, ¼Y, ¼Z, and fills the 4.5" impulse test-gap requirements of the ASA. Core and coils are mounted in a shallow cast-iron tank and extend up into a porcelain shell.

Banking FOR THE Professions

Doctors, lawyers, dentists, engineers, teachers — all those whose time is precious—appreciate our Bank-by-Mail service. It enables them to do their banking when most convenient, night or day. Safe. Fast. Reliable. Overnight to most points in California.

Write today...

for free Bank-by-Mail kit containing all necessary forms, return envelope and simple instructions.

CROCKER FIRST NATIONAL BANK
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California's Oldest National Bank

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PACKED FULL OF SALES POINTS

CHROMALOX
SUPER SPEED UNITS

Sell ranges equipped with Chromalox units. These units have a sales story with a punch. Good for replacement too — They fit all ranges. Write to our nearest distributor.

REPRESENTED by

MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
420 S. San Pedro St., Los Angeles, Calif.
THE PETERSON COMPANY
1921 Blake St., Denver, Colo.
EDWIN L. WIEGAND CO.
7540 Thomas Blvd., Pittsburgh, Pa.

Now a

FLUORESCENT LIGHTING UNIT

Made to RLM Specifications

ANNOUNCING A NEW RLM SPECIFICATION FOR A 48" FLUORESCENT TWIN LAMP UNIT

As a result of engineering studies and laboratory tests, carried on during the last few months, the RLM STANDARDS INSTITUTE announces the establishment of RLM Specifications for a new type of Fluorescent Lighting Unit especially designed for general illumination of Industrial and Commercial locations.

This unit makes available a new type of lighting. With the conventional 10 foot spacing and mounting heights, 20 foot-candles of daylight quality illumination are evenly and uniformly distributed over the working surfaces. Shadows are soft and luminous and there is no annoyance from glare or heat.

Salient points of these new units made in accordance with the new RLM Specifications are:

A. *Porcelain Enamel Reflecting Surface for diffusion and durability.* Time has proven the durability, sustained efficiency and low maintenance cost of porcelain enamel. It is not affected by heat, cold or atmospheric conditions. It is easily cleaned.

B. *78% Light Output Efficiency.* The design of the reflector, spacing of the lamps and high efficiency of the porcelain enamel reflecting surface combine to produce an unusual high light output efficiency.

C. *17½ Degree Cut-off.* An RLM cut-off standard for over 20 years and now generally accepted as good lighting practice. Insures adequate shielding of the light source to minimize glare. In addition the ends of the unit are closed to further protect the eye.

D. *Uses two 48" Mazda Fluorescent Lamps.* Approximately 100 watts used by lamp and auxiliary.

E. *New Type Auxiliary Corrects Power Factor and Flicker.* These auxiliaries are also equipped with removable and renewable starting switches located in the socket.

F. *Equipped with Auxiliaries Approved by the Underwriters' Laboratories.* All auxiliaries used in RLM units carry the approval of the Underwriters' Laboratories.

As with all RLM Lighting Units, the RLM Label affixed to a Fluorescent Lighting Unit is a warranty of conformance to RLM Specifications and is so attested to by the Electrical Testing Laboratories. This new RLM standard Fluorescent Unit will be available from manufacturers of RLM Lighting Equipment after December 15, 1939. New Specifications have been published giving complete information about this new unit. Ask your supplier of RLM reflectors or write Institute for a copy.

The letters RLM stand for Reflector and Lighting Equipment Manufacturers

RLM STANDARDS INSTITUTE
INCORPORATED

20 N. WACKER DRIVE • ROOM 1130 • CHICAGO, ILL.

THE CERTIFICATE OF RLM UNIFORM QUALITY

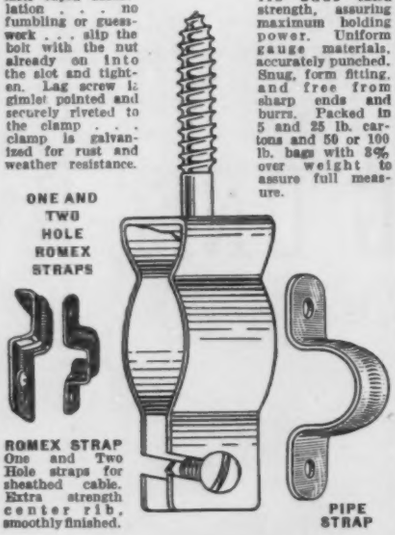
PAINE *Improved* Cable Clamp

For use on cross arms, overhead beams, etc. Paine patented slot permits rapid installation . . . no fumbling or guesswork . . . slip the bolt with the nut already on into the slot and tighten. Lag screw is gimlet pointed and securely riveted to the clamp . . . clamp is galvanized for rust and weather resistance.

PAINE PIPE STRAP

Prominent center rib adds extra strength, assuring maximum holding power. Uniform gauge materials, accurately punched. Snug, form fitting, and free from sharp ends and burrs. Packed in 5 and 25 lb. cartons and 50 or 100 lb. bags with 3% over weight to assure full measure.

ONE AND TWO HOLE ROMEX STRAPS



ROMEX STRAP
One and Two Hole straps for sheathed cable. Extra strength center rib, smoothly finished.

PIPE STRAP

PAINE

THE PAINE COMPANY
2975 Carroll Ave. Chicago, Ill.
Western Warehouse and Sales in
Los Angeles, Seattle, San Francisco, Denver

Speed Motor (1115)

A multiple belt for Variable Speed Drive Motors has been developed by U. S. Electrical Motors Inc. Speed changes on the unit are effected by turning the hand wheel which shifts the motor on the base and moves the

yoke which actuates the pulleys. A new lubrication system provides a thorough method of greasing the pulley sliding fits. The belt may be tightened or loosened without shifting the entire base.

Fire Scout (1116)

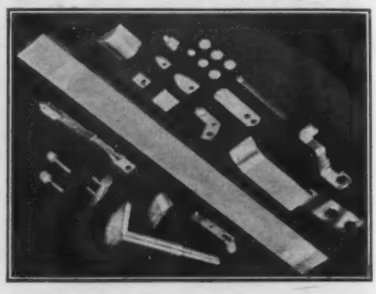
Fyre-Scout is a fire-detection system manufactured by the Technical Appliance Corp. that gives warning of fire in its very inception. The heart of the system is the detector head or super-sensitive thermostatic switch enclosed in a neat enameled housing, of compact dimensions.

Splicing Compound (1117)

Clifkrone, an ozone resisting splicing compound and cable wrapping manufactured by the Clifton Mfg. Co., is an advanced scientific compound that is claimed to produce better cables and give better splices. In a severe test conducted by the company, it was found that Clifkrone showed little, if any deterioration. Photographs and a sample are available.

Contacts (1118)

Electrical contacts, possessing the high conductivity of pure silver as well as low, constant resistance, are now being marketed to manufacturers of electrical equipment under the trade name of "Gibsiloy" by the Gibson



Electric Co. Because of its ductility, Gibsiloy —a powdered metal composition—may be formed into a wider variety of shapes than similar materials, which, owing to their brittleness, must be cast to form. Gibsiloy may be punched, machined, drilled, tapped, and resists wear to a far greater degree than pure silver.

VENT-A-HOOD . . . sensational new patented kitchen ventilator—not a fan—grease trap and centrifugal exhaust unit removes cooking odors from kitchen before they can invade other parts of the house—prevents greasy vapors from settling on walls—saves housework. Keeps kitchen cool. Biggest innovation since mechanical refrigeration. Selling by the hundreds wherever shown. Dealers and sales representatives wanted for unassigned territory—write or wire quick for literature and liberal proposition.

The VENT-A-HOOD Co.
2808 COMMERCE STREET
DALLAS Dept. E TEXAS

THE CORY REG. U.S. PAT. OFF. COFFEE BREWER

New Models—years ahead!
Beautiful streamline design!
Compact and steady standing!
Wide-neck Decanters—easy to clean!

Every CORY Sold *Complete*

Remember how the first autos to be sold complete, shot ahead of competition? History is repeating in the CORY Coffee Brewer. Packed in the carton with every CORY you sell are COMPLETE DE LUXE FITTINGS. Among them: Hinged Decanter Cover; dual purpose Stand and Cover for upper glass; Measuring Cup that eliminates guess measuring. Stand, Cup and Handle are of matching ivory-tone Bakelite or glistening black Durez. Over 14 superiorities in all. Every CORY model is equipped with the sensational CORY Glass Filter Rod; most of them also have the famous "Fast-Flo" Filter. All electric models are 2-heat (Hi-Low). Big profits from small stock. Three sizes of CORY Brewers fill all needs. WRITE for latest CATALOG.

Two Speedy Filters

"Fast-Flo" and CORY Glass ROD brew superb Coffee and Tea UNTOUCHED BY METAL

GLASS COFFEE BREWER CORP.
325 NORTH WELLS ST., CHICAGO, ILL.

How Employee Efficiency Is Increased by This NEW COLD Fluorescent Lighting

A New Lower Cost Way of Obtaining the Higher Levels of Illumination Necessary to Improve Workmanship and Employee Morale

Fluorescent Lighting provides management with a new opportunity to improve plant "Seeing Conditions" and thus improve accuracy of workmanship production, employee morale, safety and all-round efficiency.

Scientific laboratory tests and practical plant experience have demonstrated that when plant "Seeing Conditions" are improved by raising the levels of illumination and improving the quality of the light, seeing speed is increased and eyestrain and eye fatigue are reduced to a minimum. See Data Sheet No. 11 as published in FACTORY MANAGEMENT & MAINTENANCE, October, 1939.

A New Advance in Better Lighting

Fluorescent Lighting marks the attainment of a long sought goal. It makes possible higher levels of unusually fine quality light at lower cost. It enables you to obtain a light of accurate daylight quality and secure higher intensities without annoying glare or heat. Full advantage of this new light for both general and localized lighting may now be had through the installation of Benjamin Lighting Units especially designed for the 36" and the new 48" Fluorescent daylight and white light lamps.

A New Type of General Lighting

In the early development of Fluorescent Lighting its application was confined chiefly to localized lighting. Now with the introduction of the new Benjamin "STREAM-LITER," efficient and economical Fluorescent Lighting is available for the first time for general illumination.

Only by first hand experience can the daylight quality, comfort and softness of this new diffused lighting be fully appreciated. It is truly one of the most important advances ever made in general overhead lighting.

Due to the higher light output of the Fluorescent Lamps, and the high efficiency of Benjamin Fluorescent Lighting Units, this new, fine lighting usually can be obtained at a lower operating cost than that formerly required to secure comparable results.

New Solution to Local Lighting Problems

It is now practical to mount high intensity lighting units, delivering 100 to 150 foot-candles, close to the working plane of inspection tables, production lines, assembly benches, etc. Never before has it been possible to provide such high intensity lighting without annoying glare and annoying heat. Because the light generated by the Fluorescent lamp is cold light, there are no annoying heat radiations. Because these lamps have an exceptionally low brightness factor, glare is reduced to a new low minimum. Because the light source is long, it is ideal for localized lighting.

Color Corrections

For operations involving color, an economical light of exceptionally fine daylight quality can be obtained through the use of Benjamin Fluorescent Units with daylight lamps. This light is produced without the use of the filters which heretofore have been necessary to produce "daylight" with the ordinary incandescent lamp. The heavy light loss from filters is thus eliminated.

Approved by Underwriters' Laboratories

These and other Benjamin Fluorescent lighting units are ruggedly constructed, easily installed and maintained, give the highest light output efficiency, and are warranted to comply with all recognized electrical, illumination and mechanical standards. They are approved by Underwriters' Laboratories as evidenced by the inspection label affixed to each unit.

Make Needed Changes Now

Does your lighting meet present day requirements for increased production, higher inspection standards, overtime or extra shifts? A Benjamin Lighting Specialist will be glad to make specific recommendations. By training and experience he is an expert in industrial lighting and his services are available to you without cost or obligation.

Send for These New Bulletins

Complete information on Benjamin Fluorescent units is contained in Bulletin No. 600. Your return of the coupon below will bring you this bulletin now and place your name on our list to receive new Bulletin No. 610, now in preparation.

The Low Brightness Quality of the Fluorescent Lamp is combined with the unexcelled Diffusion Quality of Porcelain Enamel in the New, Low Cost

BENJAMIN STREAM-LITER

Designed specifically for general industrial lighting. Uses two 48" Fluorescent Lamps. The porcelain enamel reflector with 72½° cut-off shields lamps. New type auxiliary and starting switch; corrected for power factor and flicker. Uses approximately 100 watt. Provides 15 to 25 foot-candles on working surface. Available after December 15, 1939.

NEW BENJAMIN FLUR-O-LITER

Provides 75 to 150 foot-candles when mounted locally over inspection tables, production lines, or work benches. Also adapted to higher mountings. Uses two 48" Fluorescent lamps with individual Alzak aluminum reflector enclosed in steel housing. New auxiliary and starting switch; corrected for power factor and flicker. Available after December 15, 1939.

Other units for the 18", 24", 36" lamps and for single 48" lamps now available.

BENJAMIN
TRADE MARK

LIGHTING EQUIPMENT

Distributed Exclusively Through Electrical Wholesalers

BENJAMIN ELECTRIC MFG. CO., Des Plaines, Illinois.
Gentlemen:

☐ We are interested in data to show how our lighting may be improved. Please send us your Bulletins No. 600 and 610.

☐ We would like to arrange for a FREE DEMONSTRATION.

Name.....

Title.....

Firm.....

Address.....

City..... *State*.....

PRODUCT DATA

Keep Posted for 1c

Your being right up-to-the-minute may have an important bearing on your success. New developments are appearing daily in your field—tools to help you do a better job. Are you abreast of them? You fall back a step when the other fellow is well informed about a subject of which you are ignorant. Manufacturers' publications are a quick, efficient way for you to keep posted on current events in your field.

Isn't it a bargain to invest 1c (the cost of a postcard) to help yourself achieve the increases in earning power to which you look forward? American industry is offering a remarkable service—free. ELECTRICAL WEST makes it easy for you to enjoy this service for your own. Check and mail the coupon below. That's all you have to do help yourself toward better performance and greater rewards.

Disconnecting Switches (1119)

Rural-line outdoor disconnecting switches applied principally on lightly loaded distribution circuits where costs must be kept to a minimum, are described in a new booklet by Westinghouse. These switches are single or multi-pole, single throw, group operated, with titling insulator and vertical break. The operating mechanism is a rugged reciprocating type, with provision for padlocking the switch in either the open or closed position.

Water Heaters (1120)

Detailed specifications of Rex "round," "numode," "table-high," electric automatic storage water heaters are presented in a new catalog by the Cleveland Heater Co. All types and sizes are outlined, dimensions diagrammed, and features well illustrated.

Motor Drives (1121)

Induction-motor drives for power-station auxiliaries are illustrated and discussed in a new publication issued by Westinghouse. Included are structural features bearings, stator windings and insulation and form-wound coils for open-slot machines.

Texrope Drives (1122)

Allis-Chalmers Mfg. Co. has published a new 28-page booklet containing a vast amount of buyers' data never before available on Lo-Maintenance Motors and Texrope Drives. The booklet is designed to present a wide range of facts that, in every industry, will help specifiers and buyers in estimating costs, types and sizes of drive equipment and motors to be used under various operating conditions.

Connectors (1123)

Connectors and other cable and wire specialties are presented in a new bulletin by the W. N. Matthews Corp. Equipment is well illustrated, and details, diagrams, catalog data make this compact publication complete and interesting.

Insulation (1124)

The story behind Okonite insulation is described in a series of advertisements published in booklet form by the Okonite Co. How Okonite insulation is applied over conductors by the strip method and then vulcanized in a continuous metal mold is ably and thoroughly presented.

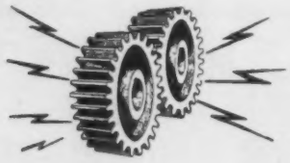
Cutout (1125)

A new low voltage cutout for 115-230-volt distribution service is described in a new bulletin issued by Schweitzer & Conrad, Inc. The bulletin describes a new safety feature of this cutout, and illustrates the flexibility in mounting method by a series of ten installation photographs.

Wires-Cables (1126)

Habirshaw asbestos wires and cables are completely covered in a new bulletin by the Phelps Dodge Copper Products Corp. Specifications, ratings, standard constructions, special constructions, some special types, braids and finishes are given together with detailed information, tables and illustrations.

ELECTRIC CONTROLS FOR INDUSTRY

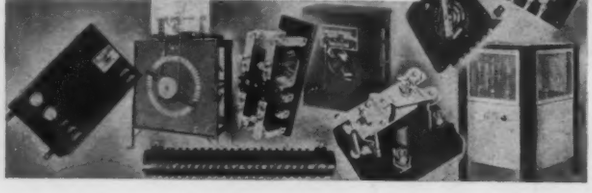


The vast experience of Ward Leonard includes the entire period of the application of electricity to industry. Usable data is therefore available for practically every type of control. In the Ward Leonard line of industrial controls you will find a piece of equipment that intimately meets all your requirements without the need of special development. Study the bulletins that will be gladly sent to you upon request. They may save you time and money and result in a more efficient application of power.

RELAYS — SPEED REGULATORS
RHEOSTATS — MOTOR STARTERS
RESISTORS — CONTACTORS
VOLTAGE REGULATORS

WARD LEONARD
48 SOUTH STREET, MOUNT VERNON, N. Y.
Electric Control Devices Since 1892

Send for bulletins of interest to you.



New Plant (1127)

A booklet reproducing 30 photographs of the new plant, offices and personnel, and a ground plan of the Uptegraff Mfg. Co. has just been issued, and it is interesting in that it is entirely devoted to showing the Uptegraff facilities for transformer manufacturing.

Welding Copper (1128)

Just off the press is an 8-page booklet completely illustrated in color describing the unique process of molten-welding copper to steel in the manufacture of Copperweld, made by the Copperweld Steel Co. Rolling, drawing, the stranding of Copperweld wire and strand and the manufacture of ground rods is included.

Automatic Control (1129)

Automatic Control is a new booklet just issued by the Electric Controller & Mfg. Co. covering many types of new units installed by the company. Custom-built models are included in this attractive presentation piece and additional information regarding the various units is available.

Stoker Motors (1130)

Featuring exclusive Thermoguard protection against improper operating conditions, stoker motors are described in a new booklet issued by Westinghouse. The motors have windings protected against moisture, and special rubber mountings to prevent noise.

Protective Devices (1131)

"How to select protective devices for low-voltage power circuits" is a new General Electric bulletin, calling attention to a serious hazard that is prevalent in factories and commercial buildings. It suggests means and ways of eliminating this hazard in existing installations and avoiding it in new ones.

Appliance Catalog (1132)

A new 32-page catalog by Manning, Bowman & Co. has been issued, showing the company's complete line of electric appliances "for any occasion." Illustrations show the features of this line, and an interesting dissection of an automatic flatiron is offered.

Localized Lighting (1133)

A handbook of localized lighting has been published by the Fostoria Press Steel Corp. showing "light on the job," and presenting the newest developments in fluorescent lighting equipment for factories, shops, and plants. Illustrations, diagrams, and tables make this handbook interesting and helpful.

Insulators (1134)

An insulator catalog with a new idea is presented by the Lapp Insulator Co., Inc., said to be the most complete insulator catalog ever published. All surplus material has been eliminated, and facts have been consolidated into useful, helpful knowledge. The publication is divided into three sections—distribution, transmission and station sections, 128 pages in all.

Electric Tools (1135)

Proper care and maintenance of portable electric tools is discussed in a new 12-page handbook, published by the Black & Decker Mfg. Co. It gives not only helpful hints on care and maintenance, but also methods of properly grounding to protect the operator, currents, proper sizes of extension cable and pointers on what to look for when a tool fails to operate.

Cleaner (1136)

A vacuum, blow and spray cleaner is outlined in a new bulletin by the Ideal Commutator Dresser Co. This three-way cleaner comes in many models, and in the Ideal "Jumbo" model, and is designed for heavy duty service with a full 1h.p. motor, and ball bearing construction throughout. A tank-type industrial cleaner is also presented.

Varnished Cambric (1137)

A new 4-page bulletin by General Electric gives complete information on the new heat-resisting varnished cambric with high dielectric strength and low dielectric losses. Diagrams show how various numbers compare as to heat resistance, dielectric strength, power factor of insulation, etc.

Disconnecting Switches (1138)

Describing outdoor group-operated disconnecting switches, a new leaflet is issued by Westinghouse. Supplied in 7.5- to 161-kv sizes, the units have a vertical break arrangement on each pole using three insulator stacks, one rotating to open and close the switch blade. This switch is recommended for the most severe service requirements.

Pivoted Drives (1139)

Because of the rapidly increasing tendency towards mounting electric motors on pivoted bases, a new Rockwood Mfg. Co. booklet is most timely. An understandable explanation of the basic principles, underlying the operation of all pivoted drives is included, also price and dimensional information for all various types of bases.

Transformers (1140)

An interesting bulletin showing twenty illustrations of various types of distribution transformers has been published by the Uptegraff Mfg. Co. Each type is briefly presented and an item on coil treatment included.

SAVE TIME! USE THIS COUPON

To keep posted, simply circle the items in which you are interested, cut out the coupon (it can be pasted on the back of a postcard) and mail to:

ELECTRICAL WEST, 68 Post St., San Francisco, California
Please send me the following CIRCLED items:

1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
1111	1112	1113	1114	1115	1116	1117	1118	1119	1120
1121	1122	1123	1124	1125	1126	1127	1128	1129	1130
1131	1132	1133	1134	1135	1136	1137	1138	1139	1140

Name..... Title*.....

Company* .....

Address .....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

FIVE "IDEAL" MONEY MAKERS

1. Wire Nuts

"Solderless—Tapeless wire connectors." Skin Wires—Screw On—**That's All! One size** for all common wiring joints. Fully Approved — Listed By Underwriters' Laboratories, Inc. MILLIONS IN USE!

2. "E-Z" Wire Strippers

Strip the **toughest** insulation without nicking or cutting strands. Models and sizes for stripping solid or stranded wires from No. 30 gauge to No. 5.

3. Cable Ripper

For ripping non-metallic sheathed duplex cable or lead covered cable. Cuts cleanly — easily — quickly.

4. Joist Boring Machine

Ends tiresome and dangerous reaching. Bores holes at any angle—reaches to 11 ft. height above floor, bores beneath floor.

5. Fish Tape, Reel & Puller

NOW fishing **IS** a pleasure! You get three tools in one—**Fish Tape, Reel** and **Puller.** Keeps tape reeled up — no expensive tape breakage — no "live" contacts. NEW! "Junior No. O"—Price $2.50. Easily fits in tool kit.

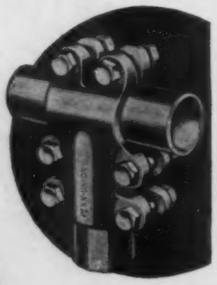
SOLD THROUGH JOBBERS

Electrical Products Division
IDEAL COMMUTATOR DRESSER COMPANY
1042 PARK AVENUE SYCAMORE, ILLINOIS

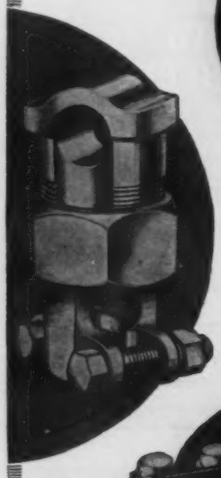
ALL Kinds of Fittings—

for every type of electrica. connection. For any combination of tube, bar, cable, or wire.

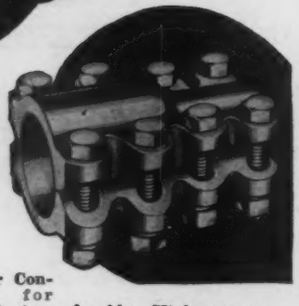
More than 6,200 items.



Clamp Type Tees in all sizes. High copper alloy; machined contact surfaces



Self-Locking Tees that hold permanently tight. With and without extension.



Reducer Connectors for different sizes of cable. High copper with Everdur bolts, nuts, lockwashers.

You will be interested in the many NEW and IMPROVED fittings in the Penn-Union Catalog. Every item thoroughly tested, Dependable.

NICHOLAS & COOK
1063 HOWARD STREET
SAN FRANCISCO

J. W. WATKINS
538 SKINNER BLDG.
SEATTLE

PENN-UNION ELECTRIC CORP., Erie, Pa.

You'll find it in the *complete* line

PENN-UNION
Conductor Fittings

LETTERS

Reproductions

Dear Sirs:

The pages of ELECTRICAL WEST very often contain interesting bits of data and occasionally a complete article of such a nature that it can advantageously be used as reference matter by various members of our organiaztion.

Photostatic reproductions make the most convenient form in which to retain this for reference purposes, but, owing to the fact that the contents of ELECTRICAL WEST are copyrighted, we hesitate to make reproductions without your consent. Assuming that any such reproduction will be used solely by members of our organization, is it in line with your policy to allow us to make reproductions of any material that may appear within the covers of ELECTRICAL WEST, specific copyrighted articles excepted?

R. H. HALPENNY,
Electrical Engineer,
Nevada-California Electric Corp.

ELECTRICAL WEST will gladly give permission to reproduce any part of its contents except the "Appliance Sales Guides" to any reader who requests such permission. We assume, however, that credit will be given in every instance.—ED.

Monthly Column?

Dear Sirs:

. . . One thing we would appreciate seeing in your magazine would be a monthly column under the heading "What Electrical Utilities Are Doing Wrong," as we are not of the opinion that everything in our work is correct. We think that a discussion of the negative side of this question would prove of value to some of your readers.

H. A. WALSH,
Sales Manager,
El Paso Electric Co.
El Paso, Tex.

How do other readers feel about such discussions?—ED.

Lamp Story

DEAR SIRS:

I have just looked through the October issue of Electrical West and want to compliment you on the splendid lamp selling story which you have in your Sales Guide this month. It certainly is a very excellent and very clear story on light conditioning for the dealer.

Congratulations and thanks.

L. P. MOYER
Lamp Dept.
General Electric Co.
Cleveland, Ohio.

Successful Sales Guides

DEAR SIRS:

Thanks for sending the Light Conditioning Sales Guides. I wanted these for distribution to our sales force in order that they might show them to dealers. I am happy to say that we have been very successful in promoting light conditioning.

C. H. THRANE
Dist. Supply Sales Mgr.
General Electric Supply Corp.
Los Angeles.

JEFFRIES

TRANSFORMERS

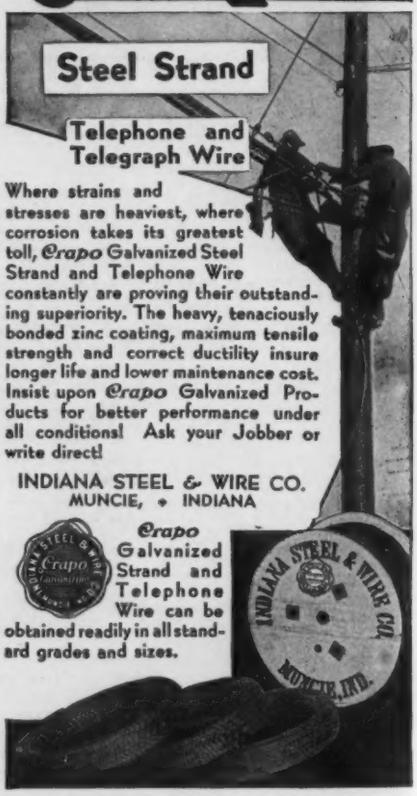
Save Their Cost and Pay Dividends by—

1. Elimination of duplicate conduit runs.
2. Saving in power rate.

(Put all of your 110-volt equipment on a 220-volt or 440-volt power circuit, it is economical.)

JEFFRIES TRANSFORMER COMPANY
5706 Long Beach Ave. Los Angeles

Crapo GALVANIZED PRODUCTS



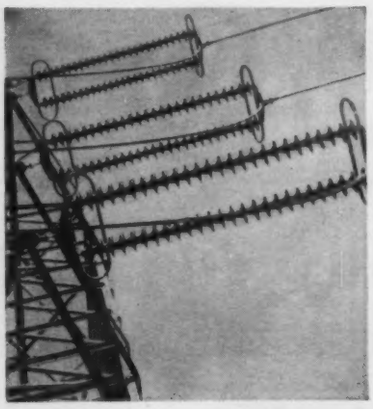
Steel Strand

Telephone and Telegraph Wire

Where strains and stresses are heaviest, where corrosion takes its greatest toll, *Crapo* Galvanized Steel Strand and Telephone Wire constantly are proving their outstanding superiority. The heavy, tenaciously bonded zinc coating, maximum tensile strength and correct ductility insure longer life and lower maintenance cost. Insist upon *Crapo* Galvanized Products for better performance under all conditions! Ask your Jobber or write direct!

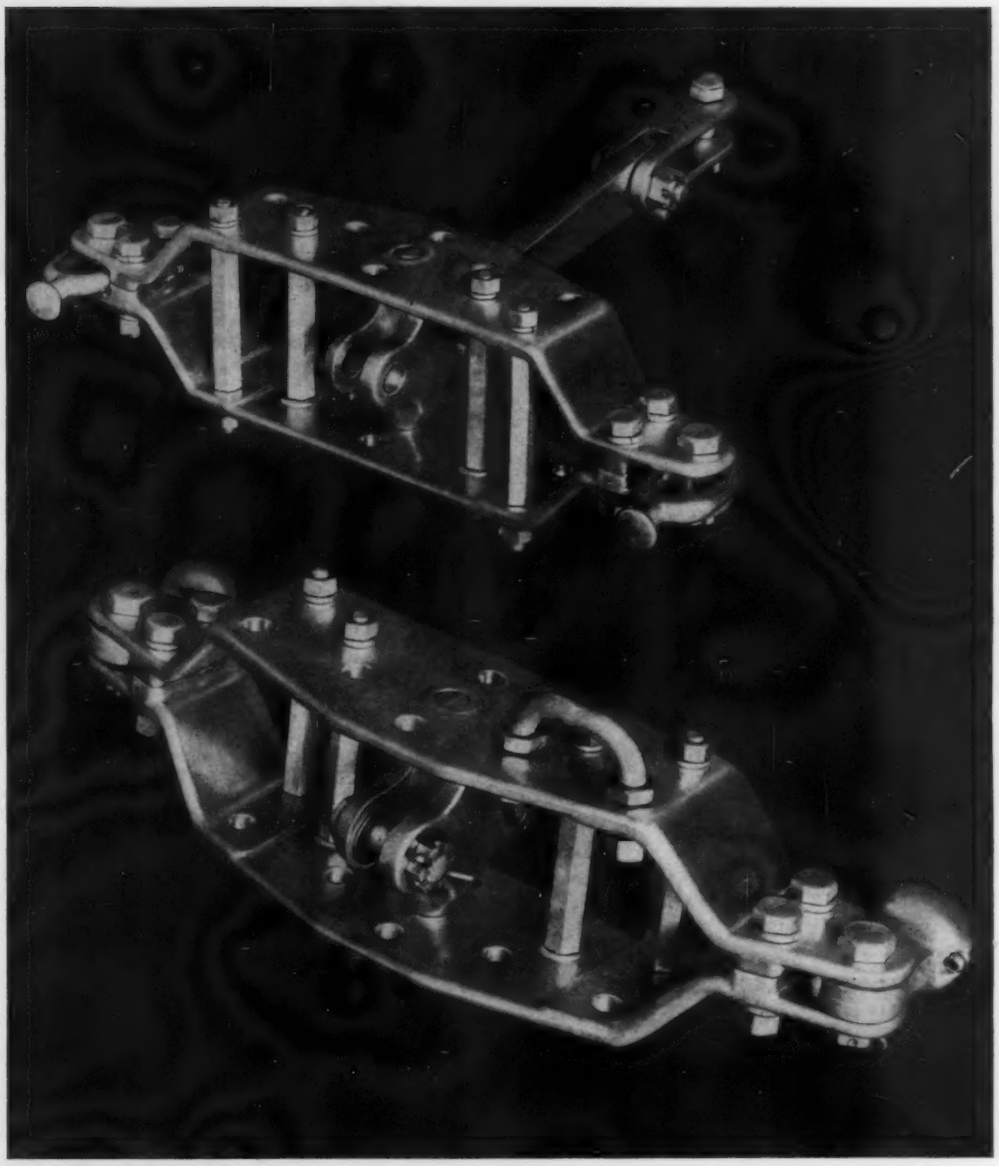
INDIANA STEEL & WIRE CO.
MUNCIE, ♦ INDIANA

Crapo Galvanized Strand and Telephone Wire can be obtained readily in all standard grades and sizes.



Longest, Highest Voltage Line

The photograph below shows in detail, an excellent example of forging craftsmanship. This yoke set of fully assembled forgings is now being installed on the longest, highest voltage line in the United States. It was forged in its entirety by BTC and chosen because of the lightness that was obtainable with additional strength. We call special attention to the rounded, non corona-inducing edges.



BTC

The Brewer-Titchener Corporation
Cortland, New York

High Tension Suspension Line Hardware

THE BREWER-TITCHENER CORPORATION

HERE IS OUR NEW STANDARDIZED TO REDUCE THE COST OF

YOU SAVE up to 4½% per Unit on the Purchase Price

Today, with the introduction of our new standardized design of network transformers, your equipment dollars will go farther than ever before in the purchase of secondary-network equipment. Simply by specifying "G-E Standardized Design" when ordering network transformers, you save up to 4½ per cent on the purchase price.

You will save on installation work, too, because the standardized design incorporates the arrangement of network protector and switch box that permits the most economical vault design for most installations. There's less volume and less material needed than with any other arrangement.

Over and above these direct savings, you gain the advantages of quicker shipment, because parts are carried in stock, and manufacturing time is appreciably shortened.

BASIS OF STANDARD

The new standardized design is based entirely on detailed study and analysis of utility requirements over the last several years. Essentially it is a design established by your efforts to obtain the most economical network transformer. Now we pass the benefits of standardization on to you in lower costs.

FLEXIBILITY RETAINED

In setting down the specifications for the new standardized design, we have been careful to provide flexibility for such necessary operating variations as: difference in voltage ratings, tap requirements, type of cable, etc.

Ask your G-E representative for further information on the standardized design, or write to General Electric, Dept. 6-201, Schenectady, N. Y., for publication GEA-3219.

G-E STANDARDIZED DESIGN GIVES THESE ADVANTAGES:

•

EASIER TO ORDER

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QUICKER DELIVERY

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ECONOMICAL VAULT CONSTRUCTION

•

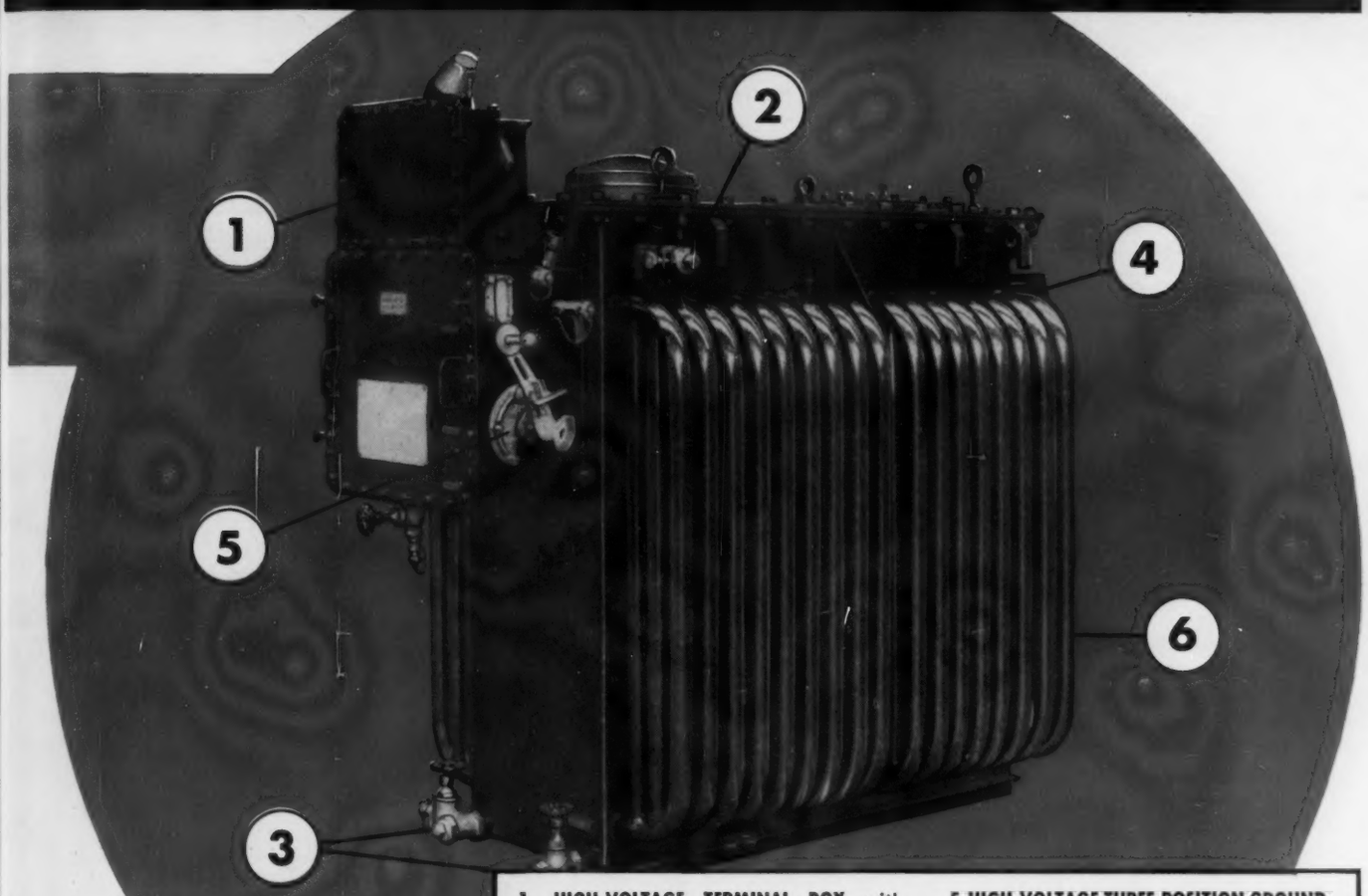
EASILY, QUICKLY, INEXPENSIVELY INSTALLED

•

CONSTANT IMPROVEMENT OF DESIGN DETAILS

TRANSFORMER DESIGN

SECONDARY NETWORK UNITS



Check these **Specifications for Convenience and Flexibility**

1. **HIGH-VOLTAGE TERMINAL BOX** with wiping sleeves for three-conductor or single-conductor cable.
2. **GANG-OPERATED RATIO ADJUSTER CONTROL** conveniently located near high-voltage end.
3. **DRAIN AND FILTER-PRESS VALVES** at bottom of high-voltage end of tank. Internal provision is made for diagonal filtering.
4. **LOW-VOLTAGE ENTRANCE** with network protector mounting.
5. **HIGH-VOLTAGE THREE-POSITION GROUNDING AND DISCONNECTING SWITCH** with cable entrance facilities at top or bottom. Cable entrance may be either wiping sleeves or potheads. "Quick break" high-voltage switch available for interrupting magnetizing current.
6. **RADIATING TUBES** of light- or heavy-gauge steel as dictated by operating conditions.

GENERAL ELECTRIC

300-85

ELECTRA'S HUSBAND

Peglerize the Language

"EVERY journalist in America should take a post-graduate course with Westbrook Pegler," I remarked to Electra as we settled ourselves under our new I. E. S. lamp. "He can put more punch in a few words than anyone I know."

"So you're going to school again?" Electra asked, with her sly smile.

"I've just finished my first lesson," I said, holding up *The Dissenting Opinions of Westbrook Pegler* for her inspection. "Three hundred and fifty pages—and every page carries a wallop. Listen to this: 'Of all the fantastic fogshapes that have risen off the swamp of confusion since the big war, the most futile and, at the same time, the most pretentious, is the deep-thinking, hair-trigger columnist or commentator who knows all the answers just offhand and can settle great affairs with absolute finality.

" 'We include experts on the budget who can't balance an expense account; economic experts who can't find the 5:15 on a suburban time-table, much less read a balance sheet; labor experts who never did a lick of work in their lives; pundits on the mechanical age who can't put a fresh ribbon on their own typewriters, and resounding authorities on the problem of the farmer who never even grew a geranium in a pot.'

"That, my dear, is writing! Don't you like that 'swamp of confusion'? And what do you think of this one about Baby Bonds? 'Henry Morgenthau is shoving out government bonds on the credit of an institution which is practically in the hands of the sheriff right now, and people regard these bonds as gilt-edge investments even though the government's cuff has been scribbled clear up to the shoulder.' "

Electra puckered her brow as she said, "It seems a little slangy to me."

"It isn't slang," I protested. "It's just good American language that a man below the rank of bank director can understand. Let me give you another sample: 'Next time Mr. Roosevelt or Honest Hal Ickes, the House Dick of the New Deal, or Wallace or Jackson or any of those honorary proletarians who swing towels in the corner of the ring sounds off in disrespect of the Old Deal I would appreciate it if somebody would refresh my memory on just what was wrong with it.' Let me read you another paragraph.

" 'For a long time when I would hear them say Old Deal in that curl-of-the-lip way I went along, too, feeling that, yes it certainly was terrible, but let me ask you this: How were you doing back in those terrible days, and if this New Deal is going to be so swell, when are those boys going to get through that long windup and let us see what they have got on the ball?' "

Before Electra could protest, I went on. "Let me read you just one more and then you can go on with your Christmas list. This one is about Eastport, Maine. Remember? That's the little fishing village which took on metropolitan ambitions when the great power program known as Quoddy was announced. The Fundy tides which for countless ages had spent themselves against the rocky shore, were to be harnessed and Maine would be put in the Democratic column for keeps.

"Pegler says, under the caption Sick Town: 'Mr. Roosevelt has abandoned Eastport to poverty and decay after showing the town a beautiful vision of big factories, a crowded seaport and prosperity. The people seem unable to believe that "the government" will go through with its announced intention of closing down the job with the work less than half finished and seven million dollars invested . . . . Not quite comparable to the ghost towns of the West, Eastport is, nevertheless, sick of a wasting disease.' "

"That reminds me," Electra said, "Whatever became of those poor people who were shipped to Alaska to live on a model farm?"

"My recollection," I replied, "is that their press agent came home for the Winter and never returned. Now tell me, what do you think of Pegler?"

Electra pondered. "He has an interesting style, but it lacks dignity."

Then I exploded. "Dignity! That's what afflicts most of the people who have enough sense to really know what's wrong in this country. Their manner is pompous and their talk is stilted. They'd rather lose an election than split an infinitive. That's the trouble with the electrical industry—especially the utilities. They lead the parade of progress in every respect but still use Victorian English when they write letters, or reports or ads with a public relations flavor.

"What they should do is to get Pegler to write some copy for them. It would shock some of the men upstairs, but it would register with those citizens who don't dress for dinner. It was a smart man who came across with this thought, 'The balance of power in America still eats in the kitchen.' Dignity indeed is like a dress suit, of which Pegler remarks, 'It is only a suit of clothes deliberately designed to be of no practical use, and the accoutrements that go with it are rank foolishness and vanity.' "

ELECTRA is a nut on electric cookery. She should be—for eleven years now she has baked, broiled, fried boiled, sauted and otherwise prepared the family meals on an electric range. Among the hundreds of advantages that she recognizes, two stand out. One is the fact that electric range does not aggravate and inflame her sinuses as does a gas stove (her eyes start to water and she begins sneezing 15 minutes after entering a kitchen where gas is the fuel). The other is the versatility of an electric range (she insists that it will do anything.) But she won't believe this story of versatility which a range service man told me.

A meter reader informed him that something must be wrong with the range in a certain farm kitchen because it smelled pretty badly. So the service man went out to look at it. He didn't have to be told something was wrong. His nose knew it the minute he walked into the kitchen. "A mouse has gotten into the switch leads and died," he thought. A moment's examination proved such was not the case. "It stunk like a family of Hottentots had just moved out," was the way he described it. Nothing had spilled on the drip pan. There was nothing wrong in the oven. As a last resort he pulled out the warming drawer. There was the answer. The family was using it to hatch chickens and one of the least fertile eggs had broken!

"That's like the newspaper account of the sick fellow in Australia that hatched eggs in bed, "Electra says. "It's just a story."

You wouldn't Shovel Meters— BUT...

Westinghouse Meters are rugged enough to be safely handled like bulk goods, with a scoop! The extra strength and stability that lets them stand rough handling is extra protection for their long time accuracy.

THIS BOOK brings you the complete story — every important detail. It tells you why Westinghouse Meters have Long Time Accuracy. And it contains a practical chart — to help in selecting the right meter for every condition. For your copy, address Westinghouse, East Pittsburgh, Pa., Dept. 7-N.

Look at Long Time Accuracy from the cost-per-year angle

Savings of even a few cents a year, credited to a single meter's gross income, may be a substantial item on the profit side.

Westinghouse Meters are designed and built to produce such savings. They save because their ball and jewel bearing is a *lifetime* bearing — it requires no lubrication — no periodic replacement. They save because their gold-plated register never corrodes — never requires cleaning. They save because their one-piece electromagnet has permanent alignment — permanent accuracy. They seldom require adjustment or calibration, even after years of service.

These savings are proved by the records of many leading power companies. Compare Westinghouse Meter records with others — on the basis of *fact*.

J-40210

Westinghouse *Long Time* Meters

SO the cost of building is high, is it? Then the pickup in business that everyone in the electrical industry has expected as a result of a building boom is in danger.

Assistant Attorney General Thurman Arnold and his 26 investigators, the newspapers tell us, are soon to launch a mass campaign of anti-trust law prosecutions in the building construction industry. It will involve some 500 manufacturers, distributors, contractors, union leaders, and public officials, probably inspectors. Locale of the prosecution, the article states, will include San Francisco, Seattle and Portland. Plans also call for simultaneous trials in 12 representative localities—a regular Roman holiday, with the construction industry thrown to the government lions.

Taxes Raise the Roof

An explanation of why building costs are high, how this situation threatens industry today

Editors of popular magazines have not hesitated to join the mob cry of "thumbs down." At least they have not tried very hard to find out causes so that they might tell the public some of the difficulties that beset this construction industry and raise its costs. A reading of these articles would lead anyone to think that the construction industry is made up of the 40 thieves in person.

It is probably true that building costs are high. It is equally true that we in the industry have had many difficulties and wastes for which the public pays. These difficulties are details and are not understood, explained, or appreciated. The government will attempt to prove to the public that there is bad blood in the construction industry, that the relationship between labor and employers verges on racketeering and monopoly, and that collusion exists to hold up the costs of building. I think the time has come to enlighten the public, especially prospective owners of buildings or improvements, as to a few of the causes for increased costs in the production of a building. Let us review a few of them here.

Few people are familiar with the tremendous quantity of free service and engineering data furnished by the construction industry in the form of estimates of costs, and the preparation of bids. All this is done without direct remuneration. It is safe to say that millions of dollars are expended each year by the industry for this free service. The resulting increased overhead must be recovered somewhere and naturally goes into the cost of a construction job. Of course this system has been in vogue in this country for years and is generally accepted as inevitable. But it does result in a cost, sometimes a heavy one.

Yet, if we get together in an association and try to pool this cost in a quantity survey bureau, or in any way attempt to take some of the waste out of this competitive bidding system, we are accused of conspiracy and collusion.

During the years up to 1930 a contractor could conduct his business on a thoroughly normal overhead which was consistent year in and year out except for slight variations governed by total volume of business. Safe investments were made in those days with the idea of earning 6 per cent per year and amortizing the investment in not over 20 years. On this premise, a young man could feel safe in starting business so that between the ages of 40 and 50 years, with careful management, he could earn enough to be comfortable and provide his own old-age security and sometimes even retire from business.

At the present time, with modern business conditions, I doubt if a young man can safely make an investment of this kind and satisfy himself that he can amortize his investment in less than 80 years. The percentage of overhead cost is rising and that of profit decreasing for a number of reasons.

The Tax Load

In the years since 1930 taxation has changed both in method and in extent. The individual who wants to build or own a building must now carry a greater burden on his financing plan than was formerly necessary. Either he gets less building for his money or he is carrying heavier proportion of social service taxation. He merely thinks that he is paying too high a cost for building. Just how much this situation has discouraged new building in the past 9 or 10 years is something the government investigators would do the world a service to find out.

What are some of these increased social service charges?

For instance, in California, Washington, Utah and several other states a sales tax is imposed on the prospective owner of a building. This sales tax in California is 3 per cent of the cost of materials. The prospective owner of a building thus pays many thousands of dollars in one lump sum as sales tax, placing a heavy burden on the financing of a building. This owner or investor, of course, also pays all of the same sales taxes that one of the workmen employed on his project pays, or that others pay who do not undertake the risks of investments or improvements that are as lasting as a building. That is, he pays on foodstuffs, clothing, and consumable goods. The great difference is that in the case of the building or improvements, the latter stands for many years with no additional reward or enjoyment of benefit as a result, while in the case of the individual person the tax is on a consumption of goods that will be replaced.

More Taxes

Then we have the Social Security and Unemployment taxes to burden the financing of those who must spend their money by thousands of dollars in order to bring into being an improvement or a new building. The purpose of the Wagner Act and of the efforts of labor organizations is to bring about livable wages and increased standards of living for American citizens. The wage scales set up are arbitrary. Any increases in these scales over prevailing standards of the past apply as a sort of a tax in the form of higher costs for non-productive hours as well as a basic cost for productive hours of work.

Compensation insurance laws are now more rigidly enforced. Such costs are also charged on both productive and non-productive labor. These taxes, Social Security and Compensation, amount to approximately 6 per cent of the cost of labor and are payable hourly.

It is not my intention to discuss pros and cons of labor scales, wages, or working conditions, nor to decry

their present standards. The only point to be considered here is the fact that those performing labor service are human beings and that an increase in pay does not necessarily mean an increase in efficiency. There are just as many non-productive hours for disabilities, physical requirements, rests, smokes, and other wastes of time, whether the wage scale amounts to ½c a minute or 3c a minute. The cost of non-productive labor, on a high-wage scale, however, reflects itself in higher building costs eventually.

With this tendency to keep piling up visible and invisible taxes and costs on the financing of a new building, no investor who is wise will rush into new construction these days. Just how much this is retarding the construction business by private investors, might make a very profitable subject for the government to study.

To sum up, in the financing of a project, a lot of money is spent for indirect costs which therefore are virtually non-productive dollars in much the same way that many of the hours paid for are non-productive hours of labor. With this double load of non-productive activities one individual investor is burdened far out of proportion when he attempts to do something beneficial to himself and to the community. He is penalized over the other individuals who do no construction and who merely consume goods.

I have made a rough estimate of some of these costs in percentages. They are as follows:

Free estimating service (in overhead)	¼ of 1%
Sales tax	3%
Social security and unemployment	3%
Workman's compensation (variable)	3%
Non-productive field labor	3%
Total	12¼%

Because of this taxation on the doing of business all contractors now have to increase their costs for the added accounting that is required. On the smaller operator who used to perform personal services and who did some of the work of a journeyman, this is particularly tough. It is now required that he devote more of his time to his business, and particularly the accounting end of it. His records must be kept in accordance with the laws governing the collection of taxes and license fees.

Of course this is fundamental in any business. Nevertheless, the labor put in on the job by the small operator-owner, often was done actually at below the prevailing wage scale for skilled workers. Often, too, he worked from 10 to 12 hrs. a day. Now that he is required to spend his time on accounting and bookkeeping he must employ journeymen at the prevailing wage and therefore must recover his own income out of the earnings of the journeymen he hires. While I believe this is as it should be, still it must be realized that the increased cost which this procedure makes necessary is suffered by the public. It has come on very rapidly and no explanations have been offered to the public to justify this sudden increase in the cost of doing electrical work.

With the necessity for collective bargaining, under the Wagner Act, and with other mutual concerns such as codes, licenses, pressures from other businesses, etc., employers are finding it necessary to join trade associations to work out mutual agreements and contracts. Rapid advancement in the industry, new tools, new materials, dissemination of information concerning new laws and regulations, all require a closer cooperation between competitors.

To function properly, and serve its members, such associations must collect dues. These dues and fees also must be recovered somewhere and so naturally the investor in a new building pays. Association dues run from 1 to 5%. Many such items were formerly paid for out of a more generous profit margin that "bunched" them under "overhead." Now because they have grown so they are added to the cost of the job because competition is so keen that it will not permit reasonable, let alone exorbitant profits. In fact, in today's market a buyer usually gets all of the advantages of the contractors' best purchasing power, plus the benefit of every device and scheme that he can develop to cut his overhead and cost of doing business. And often his profit is more of a hope than a reality.

High Financing

Where investments in the higher financial backets are made for building, it is not difficult to understand increased total costs of building of from 25 up to perhaps 40% considering the tax burden being carried by every department of the building construction. An increase of 3¼% on material and 9% per hr. on labor certainly is a burden that would increase the costs of building. That with the 6% per yr. for financing puts a load on a building project that takes many years of high earning capacity to recover. Possibly the application of taxes is not so burdensome on public buildings for it is passed on to taxpayers to pay and presumably thousands of taxpayers enjoy the benefits or use of the buildings.

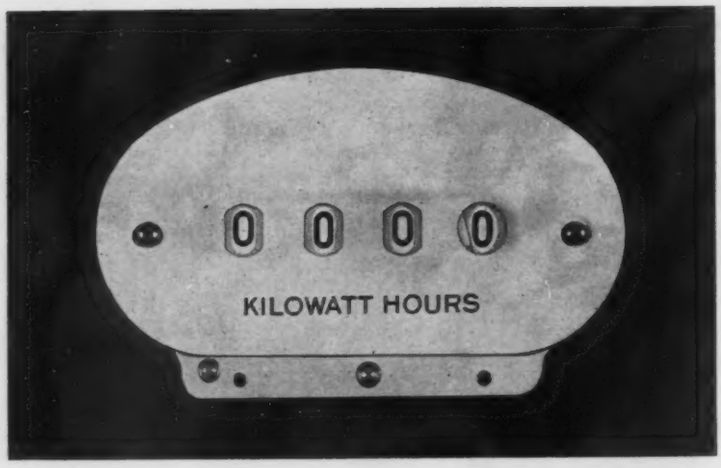
Direct and indirect taxes certainly need attention and they need adjustment. I often wonder if it would not be better to have more payrolls to distribute living wages by enabling and encouraging possible construction of buildings and homes rather than the present attempt to finance too much government on the taxation of new projects. The consumption of goods creates the greatest turnover and if more taxes could be placed on consumable goods rather than on staple property which has to be amortized over a longer period of time, a more equitable taxation would result.

Another irritating thing about taxation is that several tax collecting agencies of the state are so arranged that the funds obtained from licenses and taxes are earmarked to be used only for specific purposes. In theory this is excellent, yet several of these bureaus have built up large surpluses. These surpluses have been reinvested in property in order to keep them out of the general funds. It would seem proper that if such surpluses can be built up the licenses from which they are derived should be reduced. This burden on business at least should be curtailed. Under the present system all licenses and charges are collected by the contractor from the investor in a new building as a part of the cost of building. As the burden increases on the investor, discouragement results and there is less building. This in turn has the effect of causing a contractor's facilities to be unused a larger part of the time. He maintains a skeleton organization. His men are hired on a shorter time basis and with many layoffs. The employment cycle is interrupted continuously and this in turn is used as an excuse for high wages. Altogether the situation is a vicious circle which may account for the fact that building costs are high.

Government Costs

As long as the Federal Government is interesting itself in the high cost of construction. and editors of the popular magazines are not bashful about publishing articles adversely criticizing the industry without ascertaining the facts, it seems only right that attention should be called to this situation. The place to understand these higher costs possibly lies in analyzing government costs themselves. These costs increase the cost of operation and naturally, the final selling price of a new building or home.

And as they affect new building construction, they affect every branch, every person in the electrical industry.



Sangamo Photo

METERING

Growth in load plus growth in system plus evolution in equipment present meter men with compound difficulties. A summary of the status quo followed by selected PCEA reports on metering

AT the very end of the electric system, working year in and year out, twenty-four hours every day, is that astonishingly accurate and self-sufficient machine: the commonplace watt-hour meter. Through peace and war, boom years and depressions, while men's minds skip and veer from one puzzle to another, millions of meters continue with their single task—taking the pulse of this electric industry.

At first thought, it would seem that such a well-disciplined brain-child could cause its guardians no concern. Why is it then that once a group of meter men converge in a small room earnest voices can be heard—talking shop? Why do the voices go on and on, until their masters are driven out through sheer necessity to refuel? There are good reasons.

Of Meters and Men

Like mankind, meters are a mass-production problem. Like men, they cannot last forever, and fitter fellows come along to take their places. Like men, they'd be less of a problem if their environment were static and if they were all alike. And another parellel might be drawn around the fact that neither they nor their creators get much credit for a task well done but draw an abundance of attention where they fall a trifle short.

Millions of Pennies

The voices in the small room have their troubles. A penny a meter is a big figure where a million meters are involved. There were 3,677,000 customers in the eleven Western States on January 1, and more than 80,000 new ones were taken on last year. Considerably bigger will be the figure for 1939.

Couple this growth in numbers of meters with growth in the sizes of individual loads, add to that the imperative that the smallest possible unit saving be recognized and exploited, and it becomes plain why meter-men's problems are aggravated in the West.

Buying meters for a fast-growing Western system would be simple if meters never changed. But refinement is a continuous process, and in buying a new meter, a meter man must consider the meters he already has, because it is desirable to emerge with an assortment of equipment which is somewhat more coordinated than the vessels of the British fleet.

Buying meters would also be simplified if loads would grow like he-men, leaving their childhood behind. But, unfortunately, the necessity for metering a large load is accompanied by the necessity for metering a mere fraction of that load, frequently on the same service, always somewhere else on the system.

Accuracy Range Widens

That is why the demand for wide-range accuracy has been an important recent trend. This demand appears to be leading toward standardization on the 15-amp. meter, instead of the 5-amp. meter, for single-phase residential services.

With reference to current transformers, the same trend is noticeable in the proposal for national specifications embodying longer loading range, and designed to reduce stocks and eliminate some existing units. The proposal is to affect transformers in the 2- to 14-kv. classifications, which are to have higher impulse crests, standardized ratios, overload capacities on the order of 150% continuous, 200% for 2 hr.

The fact that Western rates are both low and continuing downward bears on the meter problem in several ways. In the commercial-customer field, there is a continual movement toward combined metering of light and power. For example, such rates have been announced recently by California-Oregon Power, by Public Service of Colorado. In the residential field, low rates lead to increased usage and an ever-growing spread between light and heavy load at a given home. In all fields, more elaborate meters must meter more energy more accurately and yet earn back their cost at a lower rate per kw.-hr.

Meanwhile, with a few important exceptions, socket-type instruments continue to be favored, though more attention (especially in the East) is being given to enclosures. The well-established trend toward new-sequence continues to gain ground. But this brings meter men face to face with the hypothesis that man can create nothing that man can't destroy. Better equipment seems merely to be a challange to those whose talents run toward getting something for nothing at any cost.

Stolen Power

Current diversion is the meter man's expression for out-and-out theft of a kind which can be accomplished only after plenty of malice aforethought. You must get close to that little room, and put your ear to the transom in order to learn that such a thing exists. Exception to the hush-hush policy appeared in Los Angeles this summer, when daily papers carried stories about the Bureau of Power & Light's efforts

to track down those who are cheating the utility.

In general not serious, current diversion is nevertheless of first importance in a number of particular places in the West. Main weapons in use—and no new ones appear in prospect—are greater vigilance and more tamper-proof installations.

But there are more congenial aspects of human relations with which Western meter men are becoming increasingly concerned. The customer regards the meter as his own business, after all it is counting out his pennies, and every meter man today knows that each meter has a human "element" which he can no longer regard as being entirely the concern of someone else.

Easy Reading

This aspect of metering has affected even the design of the equipment itself, and this year has seen more attention focusing on the easy-reading or cyclometer-type meter (illustrated opposite page). REA has adopted such a meter, and Northwestern Electric has bought some to see how they work out.

The idea of doing for the public mind what the automatic gear shift does for the autoist's arm—relieve it of a slight exertion—is generally considered to be a desirable end in itself. As a means to this end, the cyclometer meter is being regarded with increasing seriousness. How far the trend will go is not yet evident.

Suggestive of other human-relations subjects to which meter men will be turning attention are two topics which the meter group of the PCEA proposed for future study: the education and training of meter men, testing equipments and procedures that will not interfere with customers' services.

In California, meter men look forward to a Railroad Commission ruling which is expected to set forth meter test periods. This has been a live topic in California for some years (PCEA paper follows). Everywhere, meter men look forward to getting the new EEI meter handbook, which, bar accident, is due to be released in January.

Old-Age Plans

How to retire old meters is a ubiquitous question. Many systems, notably in the Northwest, follow a policy of rebuilding, both to higher capacities and to conversion to socket type. Others, notably in the Southwest, follow big-scale replacement programs, junk the old meters. Economies are claimed for both, indicating the problem of the individual system to be the deciding factor.

In the laboratory, emphasis is on better instrumentation for test, on standardization of records. Portable testing equipment is becoming more common for the field.

Everywhere in the West, attention is on the future, and meter men are on guard against basing their actions today on an under-estimation of the loads of tomorrow.

Westinghouse Photo

Test Periods Vs. Meter Accuracies

In a new analysis of earlier data on 26,000 meters, the author of this PCEA report shows why, on cost alone, periodic testing can't be justified

By George Searle

WESTERN meter men, as a group, first concerned themselves with the question of test period just 20 years ago and appointed a sub-committee to investigate the matter. The first report, made in 1920, discussed the practices of the several utilities, both local and Eastern, and the rules of various regulating bodies, but there was no statistical data available to support any of the exceedingly diverse ideas expressed.

In the belief that specific information was needed to make a reasonable determination possible, the sub-committee started the collection of data from as many Pacific Coast utilities as could be prevailed on to cooperate. Single-phase meters of 25 amp. and less were selected for the tabulation, and the contributors were asked to report, from current tests, the errors of every such meter tested and the period elapsed since prior test. In order to obtain data on meter behavior over long periods, all tests, for whatever reason made, were included. Periodic tests alone would have been insufficient.

The first report, made in 1921 and amplified in 1923, covered 8,500 meters. In 1924, 8,200 meters were added, and a report made in 1926 covered 8,900 more. Close agreement was noted between these separate reports.

No further collection of data was attempted, but in 1927 a summary was made combining in a single compilation the results of the previous reports, and embracing nearly 26,000 tests. Results were expressed by a set of curves, showing percentage of meters within the accepted limits of accuracy, and those having errors of 4% or less, for test periods of from one to ten years

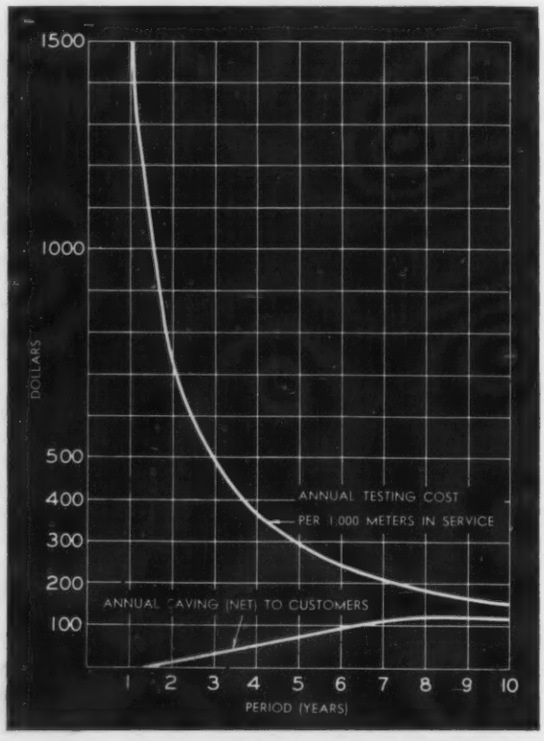


Fig. 4—Meter testing costs more than customers gain

These curves indicated that no very serious condition would result from allowing meters to go untested indefinitely, but told nothing about the condition of meters with errors of over 4%. In order to supply this lack, tabulations were included which summarized the light- and full-load correction factors in each period. These appear in Tables I and II and Fig. 1.

While comprehensive, these are not very informative without rather close study. It will be my endeavor to extract from them some information on how meter accuracy is affected by test period.

I note first that a number of meters in each period were completely stopped. These approximate 1%, and are not more numerous among ten year than one year tests. It seems clear that such meters do not belong in a study of the effect of test period. They should be, and no doubt are, detected by the meter readers and bookkeepers long before they are reached by the tester, even where testing is done annually. Their presence in the table is due to the fact that a great many of these tests were made at the request of the bookkeeping departments.

Second, it is interesting to observe the division of inaccurate meters between fast and slow. For simplicity, I have taken the average number between light and full load and constructed the curves in Fig. 2. The slow meters show a slight increase from about 3% at one year to about 6% at ten years, while fast meters climb rapidly from 3% to nearly 20% of the number tested.

The latter result is surprising and quite inconsistent with experience in

Table I—Summary of Data on Meter Test Period

(Letters L and F Indicate 10% and 100% Load)

Correction Factors Found	Meters Tested in Each Period																			
	— 1 —		— 2 —		— 3 —		— 4 —		— 5 —		— 6 —		— 7 —		— 8 —		— 9 —		— 10 —	
	L	F	L	F	L	F	L	F	L	F	L	F	L	F	L	F	L	F	L	F
Under .90	8	6	4		4	1	1		5	5	3	3	3	3	9	1	4	1		1
.90- .92	4	1	3	1	2		4	4	2	1	1		1	2	1	3	4	1	1	
.92- .94	9	6	5	3	7	2	6	4	5	9	9	8	15	14	13	17	12	10	6	4
.94- .96	40	26	23	14	42	35	59	41	49	37	52	45	46	45	37	35	54	43	22	30
.96- .98	247	198	201	150	345	259	287	252	327	287	164	164	115	140	126	148	209	215	127	79
.98-1.02	4844	5044	5213	5381	2260	2446	1614	1741	2284	2471	1145	1230	747	763	739	801	1113	1205	1316	1456
1.02-1.04	161	88	90	37	91	38	69	32	135	43	62	18	35	16	51	9	62	19	89	37
1.04-1.06	38	16	29	7	18	3	15	5	25	9	17	1	5	4	15	2	21	6	30	6
1.06-1.08	16	9	7	1	4	1	8	2	17	4	5	2	2		9	1	11	4	10	1
1.08-1.10	13	4	7	1	3		10	1	4		2	2	7		7		4		4	2
Over 1.10	18	13	17	11	16	8	12	6	14	2	11	2	11	3	10	3	12	4	10	1
Non-Rec.	72	59	47	40	37	35	27	24	21	20	26	22	14	11	17	14	12	10	15	13
Total Meters	5470		5646		2829		2112		2888		1497		1001		1034		1518		1630	

Table II—Sources of Data on Meter Test Period

Co.	Test Period—Years 1	2	3	4	5	6	7	8	9	10
A	1594	1111	780	564	556	512	399	323	313	485
B	367	95	63	90	471					
D	568	656	11	40	272					
E	1857	2451	404	338	736	237	202	331	385	174
G	1084	1333	1556	1021	771	666	349	348	792	923
H			15	59	82	82	51	32	28	48

Table III—Mean Corrections

Period Years	Fast Meters	Slow Meters
1	.959	1.056
2	.965	1.067
3	.967	1.063
4	.966	1.064
5	.964	1.051
6	.961	1.061
7	.958	1.075
8	.957	1.068
9	.962	1.064
10	.964	1.051

my own company. Our over-all average of a.c. meters shows about 5% of them slow and about 4% fast. However, we can only take the tabulation as we find it, remembering that it is a composite of data submitted by six different companies and represents meters installed under widely different conditions.

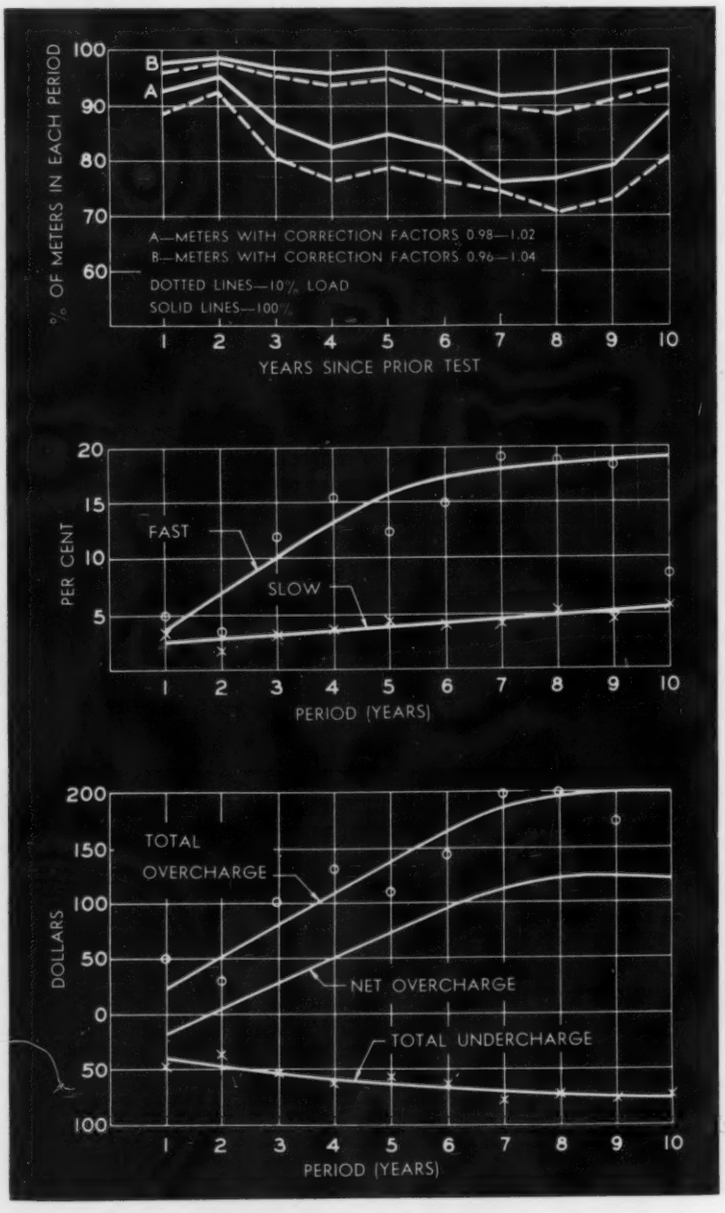
It may be of interest to note the results obtained elsewhere. C. P. Stahl of the Wisconsin Power & Light Co. gives in *Electrical World* of April 22, 1939, the experience of his company. Meters there are required to be tested every four years, and Stahl finds that of meters manufactured prior to 1926, those having correction factors 0.96 to 1.04 at light load were 96.0% of the total, and at full load 99.2%. Corresponding figures at four years from our tabulation are 93.3% and 95.9%. Stahl also finds more meters slow than fast.

The third point I have undertaken is to determine the condition of the inaccurate meters. To do so I have assumed that every meter in a given accuracy bracket has a correction factor equal to the average correction factor for the bracket. For example, one year period, light load, 247 meters shown, between 0.96 and 0.98 were assumed to have correction factor of 0.97. Taking the product of these figures, then adding similar products for each accuracy bracket, and dividing by the total number of meters involved, a mean correction factor was determined for both fast and slow meters, and for each test period. It was assumed further that the actual correction factors of meters listed as less than 0.90 and greater than 1.10 were 0.75 and 1.25 respectively. The results appear in Table III.

It is immediately apparent that, although the volume of inaccuracies increases with longer periods between tests, the mean condition of the inaccurate meters is a constant and not a function of the test period.

A study of this subject would be incomplete without consideration of what the conclusions mean in dollars and cents to the utilities and to their customers. I may be justified in the assumption that the average annual consumption per meter is 1,000 kw.-hr. and that the average rate is 3½c per kw.-hr. If so, it is probable that the rate block applicable to the use of correction factors approximates 2½c per kw.-hr. By reducing the number of fast and slow meters in each period to the basis of meters per thousand in service, and applying these assumptions with the mean correction factors already determined, I have prepared curves (Fig. 3) showing for each thousand meters in service, the amounts by which some customers have been overcharged and others undercharged. The maximum overcharge of $200 is only

Fig. 1 (top)—Time variation in occurrence of meters of given accuracies. Fig. 2 (center)—Division of inaccurate meters between fast and slow. Fig. 3 (bottom)—Amounts of overcharge and undercharge for different periods



0.6% of the $35,000 annual revenue, and the net overcharge after deducting undercharges is much less.

I have no figures on the cost of testing such a varied assortment of meters, urban and rural, domestic and commercial, lighting and power, installed under all sorts of conditions. Whatever the cost may be, it must include not only labor and transportation, but administrative and laboratory costs and instrument upkeep. Perhaps it may amount to a dollar and a half per test.

Meter testing is an operating cost, and as such is reflected in the rates and is paid for by the customers. It may therefore be regarded as an expense to which the public goes to protect itself against the effects of metering errors. Unless the net saving to our customers exceeds the cost, they are being put to needless expense.

The curves in Fig. 4 show the annual net saving and the annual cost of testing, at $1.50 per test, per thousand meters in service. Obviously, the public loses. Even if tests can be made for half the assumed amount, no worthwhile saving can be offered the public. Even the small apparent saving would probably disappear, because periodic schedules are applied to all types of meters alike. The meters considered herein were all manufactured prior to 1926, or just before the development of the modern meters with their superior accuracy. As we increase the proportion of these meters on our lines, we are assuredly improving our over-all accuracy. I can therefore see no justification for making any periodic tests of the smaller single-phase meters except in cases of known high usage.

What Size?

Arguments appear to favor 15-amp. meter as standard

By T. W. ERICKSON
Pacific Gas and Electric Co.

UP-TO-DATE meter departments must work with an eye to the future. The long life and generally efficient character of the modern watt-hour meter forces them to such procedure.

The Pacific Gas and Electric Co. purchases new meters only to the extent which is necessary to take care of new business and to replace burnt-out meters. The large number of 5-amp. meters which are still on PG and E lines and which are giving good service will remain in service, because it is not the company's policy to replace these. It is our belief that wholesale replacement is not justified.

Let us consider first the place where most single-phase meters are used, namely, the home. The average working man likes to own the house he lives in. And he likes to attain ownership as soon as he possibly can. Therefore, he will first purchase a small home—one which will not require a very large electric meter.

As time goes on, his job and conditions become better for him, he adds more load, finally may add another room or two. All this usually without notifying the electric company that a change has been made. The first time the company hears of this is when a meter man or a troubleman finds the small-capacity meter with very badly burnt current coils, but still operating although with slow correction factor.

Particularly will this be true in the future as the new meter sequence—meter-switch-fuse — becomes more and more universally used. With this system, there is no switch or fuse of certain capacity to limit the current flow, only the size of the service cable or wires, and these must be large enough to prevent excessive voltage drop to consumer's load.

The modern meter, with its long-range accuracy, both at underload and overload is an obvious answer to the above conditions. The 15-amp. watt-hour meter will fill this order admirably. It has a 100% accuracy curve at the 1-amp point, with a starting torque of approximately 7 watts. On the overload end of the curve, it is 100% accurate up to 50 amp. and at 60 amp. is less than 1% inaccurate. It will carry 300% overload, or 60 amp., continuously.

This, then, is the watt-hour meter we can install on all new services, either new-sequence socket-type or standard indoor house type. It will take all the overload that would be put on it including an electric range load.

Recent drop in price of the 15-amp. meter, due to the larger use of this size by utilities in the middle west, southern, and eastern parts of the United States, makes it the same price as the 5-amp. meter. This gives the utilities the added protection, at no additional cost, of ample overload meter capacity, making the unit free from burnouts, eliminating trouble calls to consumer's premises, and forestalling the presence of slow-correction-factor meters on the lines, which otherwise might run for months and maybe years before discovery.

Another important item in favor of purchasing the 15-amp. meter is that it standardizes meter department and wagon stocks and decreases the danger of setting the wrong size meter on the job.

Standardization of meters and metering equipment is the trend today. It is a very important item for meter departments to follow. Several of the meter manufacturers within the last year have placed a combination two- and three-wire meter on the market. This is a standard three-wire meter so built that internal connections can make it a two-wire meter for use on two-wire service. Later, if the load increases so that a three-wire service is necessary, the meter can quickly be reconnected in the field for three-wire circuit. This may become our universal meter in the program of standardization.

Irregular Loads

Nature of demand, p.f. or wave shape not serious

By H. D. NOREN
Coast Counties Gas & Electric Co.

WITH the increased use of harmonic-inducing apparatus, such as mercury arc rectifiers, arc welding transformers, therapeutic equipment and gaseous lamp equipment, the question of watt-hour meter accuracy on complex wave forms has been emphasized.

Referring to Fourier's theorem, we find that any single periodic function, such as a complex wave, can be resolved into a fundamental periodic function, and a number of harmonics. This being the case, we can break down these distorted or complex waves into the 60-cycle fundamental sine wave and a number of harmonic waves which are equivalent sine waves of higher frequencies.

The sum of the instantaneous powers of voltage and current waves of unlike frequencies is zero. From this we see that the harmonics act independently in the circuit, with the result that the power of each harmonic follows the laws for a sine wave of its frequency, being dependent only on the voltage, current, and power factor of that harmonic. The total power is the summation of the powers of the several harmonics and the fundamental.

Since the watt-hour meter operates on the induction principle, it is very sensitive to frequency changes, therefore, these complex waves, being made up of harmonics of higher frequencis, will produce frequency errors in the meter. We are all familiar with frequency errors in watt-hour meters so it will not be necessary to discuss frequency errors at this time.

Definite errors are difficult to predict because of the variety of complex waves encountered and the difficulty of measuring harmonics and their phase

relations. Meters on complex wave forms will, in general, run slow on unity-power-factor and fast on lagging-power-factor loads.

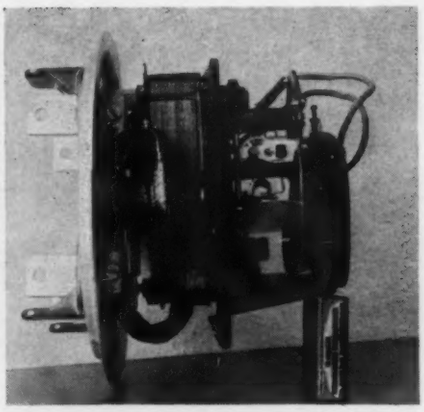
From tests we find that the third harmonic produces the greatest error in the watt-hour meter. A meter on a circuit in which both the current and voltage waves consisted of a 60-cycle fundamental and 20% third harmonic registered approximately 1.5% slow on unity, and 5% fast on 50% lagging power factor. With this same third harmonic in the current wave only, the errors were approximately 0.4% slow on unity and 0.5% fast on 50% lagging power factor. The results are the same for either flat or peaked wave.

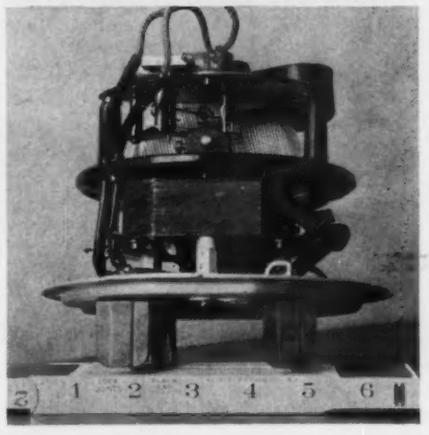
In summarizing it might be stated that for all wave forms generally encountered in service, including those of mercury-arc rectifiers, gaseous lamps and floating lines and transformers, meter errors should not exceed 1% or 2%, and the greatest errors are on the very low-power-factor loads.

Field Test

Socket and selector on truck-door panel save time

MORE attention to field testing brings a report from Southern Colorado Power, Pueblo, on a portable set which has been used with success there for testing residential, socket-type meters at the service. Besides making the job safer by largely eliminating the use of ladders, it simplifies the procedure and saves time.





Two views of the peak limiter which is built on the meter principle, for socket mounting

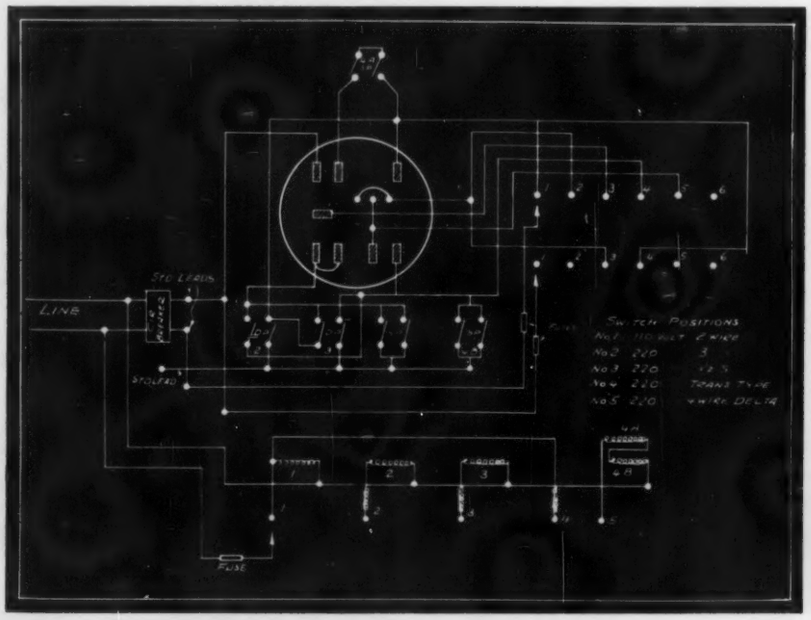
The equipment consists of a test board mounted on the inside rear door of a truck body. On the board is mounted a meter socket. The test man removes the customer's meter from its socket and replaces it with a plug. This plug restores the customer's service and connects leads from the test board to the source of power. He then inserts the customer's meter in the socket on the test board.

There are five types of meter in common use on the Colorado system, and a selector switch is provided to make proper connections for each of these. (See wiring diagram.) These are 2-wire 110-volt, 3-wire 220-volt, 220-volt V-2-S, 220-volt current transformer, and 220-volt 4-wire delta.

Thus the scheme applies the plug-in feature of the socket-type meter to the testing of the meter itself. Delay in making connections and twisting thumb screws is thereby eliminated.

According to H. H. Tureman and L. F. Hayworth, both of the company, the scheme has proved very satisfactory.

Wiring diagram. Selector provides means of connecting for any of five meter types



Peak Limiter

Meter mechanism permits very flexible time delay

METER mechanism is being put to a new use—that of peak limitation—in a device which has been developed, and a patent applied for, by E. J. Singrey and L. R. Spaulding, of Northwestern Electric.

Several things about the new device are promising, among them the fact it can be made to produce almost any given time delay before opening or closing the circuit, and can be so arranged that opening and closing time delays are different. The idea is to introduce the limiter on domestic services in conjunction with water heaters, placing it ahead of all load except the heater which it is to control.

Basic principle is this: The limiter is so wired that at no load it has an appreciable, constant forward speed. As load increases, the effect of the increased current is to decrease the speed of rotation of the limiter element until, at the predetermined peak, it is standing still. As current increases beyond peak, the limiter turns backward.

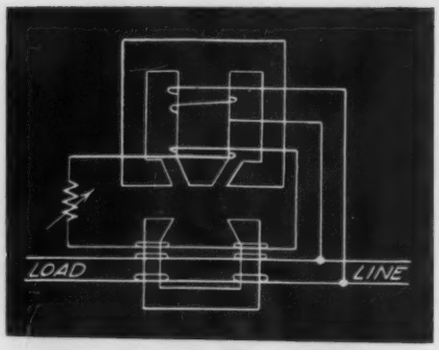
As the meter mechanism starts to rotate in one direction or the other it acts through a gear train to tilt a mercury switch. After a given number of turns, by which time the switch has reached the limit of its movement in either the "open" or "closed" direction, a latch prevents further move-

ment of the meter mechanism in the same direction.

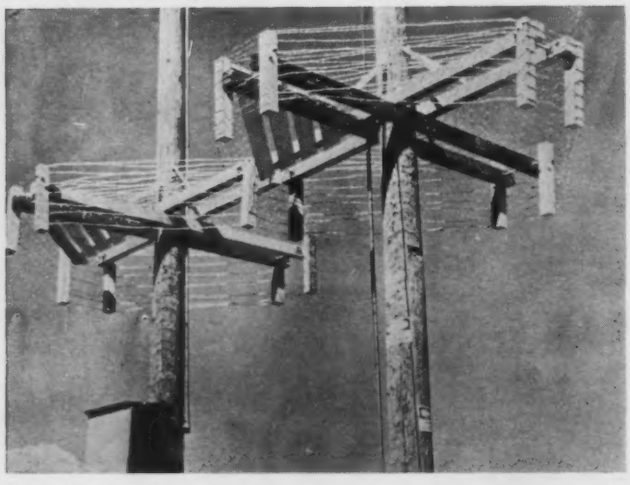
A 25-amp. winding is used on the current core, and windings are as shown in the figure. The adjustable resistance provides for pre-determining the load at which no motion will occur.

By selecting the desired gear ratio, and by employing an auxiliary gear train which is diconnected for one direction of motion, almost any degree of time delay can be introduced. For instance, it might be desired to prevent a motor-starting current, or other transient, from causing opening to occur, and a 1-min. delay could be introduced. At the same time, a 1-hr. turning-on time could be secured by a one-way-operating, 60/1 gear ratio.

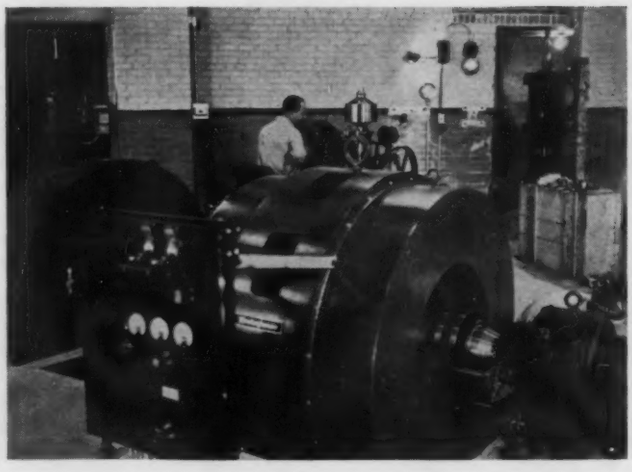
It has been found in Portland, where residential peak occurs around 5:30 p.m. as a result of range load, that limiters with such settings can be expected to disconnect seven out of eight water heaters during peak hour. Other limiters, under the same conditions, have been found to disconnect but three out of eight. By making the limiter introduce several off periods of short duration, the chance of a customer's exhausting his hot-water supply is decreased.



An economcial feature of the limiter is that it can be made for socket mounting or can even be incorporated into a two-element meter, that is built into one case with the watt-hour meter itself.



A WAR to make the world safe for small boys is being waged by Public Service Co. of Colorado at Denver. As football season wears on, keeping boys, both small and big, from using the company's poles for bleachers, becomes increasingly hard. Hence Public Service engineers dusted off these barbed-wire entanglements which were so effective last year



NEW HYDRO capacity is resulting from modernization work on the Colorado Springs municipal system. The city's Manitou plant has the highest head in the Rocky Mountain area, 2,420 ft. Typical of the new units being installed there, under the direction of F. H. Wiley, the city's electrical engineer, is this Pelton wheel and 2,500-kva. Westinghouse generator

Automatic Start

This procedure is favored for large hydro machines

By A. F. AYRES*
Nevada-California Electric Corp.

PRESENCE of an operator in a station once was accepted as an indication that switching should be under his manual supervision. However, with the development of automatic-control devices, it has sometimes been found desirable to make certain switching operations entirely automatic. There appear to be certain types of stations where a combination of manual supervision and automatic control should logically form a friendly combination. This discussion is intended to apply only to such attended stations with special emphasis on the use of automatic-starting devices for rotating equipment.

It is felt that there should be no question regarding the proper division of responsibility between automatic equipment and the operator such as was encountered by a certain husband who told his wife he wanted to know once and for all who was boss in the household. His wife's reply indicated that he would be much happier if he didn't find out.

This paper is not intended to serve as an authoritative treatise on the subject of automatic-starting equipment, rather it has been prepared with the intention of presenting certain questions to serve as an "automatic starter" of general discussion.

As to the necessity or desirability of providing automatic-starting equipment at an attended station. Is the operator apt to look upon such equipment as indicating a lack of confidence exists in his own ability? Again considering the man, if the requirements on an operator's time are decreased by automatic-starting equipment, is he apt to become lax in his remaining duties? Perhaps speed of bringing a unit on the line or greater safety to operators and equipment might be logical reasons for using automatic equipment. Would it not also be proper to assume that identical performance under automatic-starting should tend to minimize disturbance to the system?

Generator Automatic Starting Equipment

The first division of this topic may logically deal with the automatic starting of generators. It is assumed that complete automatic-starting sequences are much more familiar in hydro generation than in steam plants, so this paper is confined entirely to hydro units.

* Abstract of PCEA report.

Where an operator is normally in attendance at a generating station it may be difficult to justify the addition of automatic-starting equipment economically. Other considerations must alter this apparent economic balance in order to permit adding electrical control features to valves, needle nozzles, deflectors, etc.

Recently an inquiry was made relative to the very elaborate automatic push-button starting equipment provided for the generators in the Boulder power house. The feeling was that the operating companies had seen fit to bypass these features and employ manual starting. In the case of A-8 unit, the automatic-starting equipment is used as intended, except for two alterations. The main butterfly valve and the braking system were changed to manual control; other starting operations are automatic.

The automatic synchronizing features are not always used for this unit as normal operation calls for synchronizing to be handled at the other end of the transmission circuit.

Perhaps the use of automatic-starting equipment in a hydro plant introduces hazards which might not be present under hand control. Is there not some possibility that automatic control of hydraulic equipment may increase the danger from ram in pipe lines and valves? Also, is the automatically controlled application of the water stream to an impulse wheel apt to be made more rapid than might be the case under hand control thus, perhaps, introducing undesirable stress in buckets or wheel?

From the standpoint of automatic-starting equipment, does experience indicate that the various devices are foolproof, or is excessive maintenance necessary to insure proper operation? In connection with automatic synchronizing devices, are results equal to anticipations in reducing the severity of system disturbance in connecting a generator to the line? Are these automatic synchronizers found to be faster than manual paralleling, or are they used only when there is no special need to hurry, as one operator reports.

There may be some difference of opinion as to the limits to which the automatic-starting sequence should be extended. Since an operator is in attendance, perhaps it may be considered sufficient to have only the governor control and synchronizing operations automatic. On the other hand, it may be desired to include all valve action carried out prior to the actual starting operations as a part of the automatic sequence, or in stream flow plants, even to have the load setting automatically controlled by a float in the forebay.

These points raised relating to automatic starting of generators are not intended to convey the impression that such equipment has no place in an attended hydro station. It is reasonable to assume that there are many arguments favoring the use of such equipment that have not been mentioned which may be brought out in general discussion.

Costs of Unit Substations

By F. D. BEARDSLEY*
Coast Counties Gas & Electric Co.

COST comparisons between unit- and conventional-type substations, from which any general statements can be made, are not easy to prepare. Depending on the choice of equipment, we may or may not have equivalent features or performance. The choice between induction regulators, step regulators with 10% plus or minus range or step regulators with a total range of 10% may mean the difference between the conventional substation's being higher than, equal to or lower than the unit substation in cost.

If we are looking to the minimum cost in the conventional unit, we could, for example, use a wood-bus structure in place of steel, at least for the small sizes of stations. Again, the usual bypass and disconnect switches on the oil breaker could be omitted.

It can be said that the unit substation will cost more than the major items of the conventional unit. Savings, however, will be made in the purchase of land, foundations, fencing, overhead bus structure, bus wiring, and in the labor and miscellaneous expense of installation. The selection of one type or the other will not generally rest with price comparisons alone.

In rural areas, the difference between land costs for the two types may not be of much importance; however, in urban locations, the savings in land possible with the unit station might be a deciding factor.

A point which is given more or less prominence as an advantage for the unit station is its high salvage value. Whether this point is of great importance is open to argument. Some will say that we do not install stations with the thought that we may want to come along some time in the future and move them to new locations. While this is true, many of us probably know of examples where unforeseen developments have shifted the load contrary to the expected trend of load growth.

Estimates for a 1000-kva. unit show that, exclusive of overhead charges, a maximum salvage of 94% can be obtained for a unit substation as compared to 88% for the conventional type. The following list of items, which cannot be completely salvaged, will illustrate the difference in the two types:

	Conventional	Unit Sub.
Land	$500	$300
Foundations	150	40
Fence	360	170
Overhead bus structure	300	60
Bus wiring	350	100
	$1660	$670
Possible salvage	450	150
	$1210	$520

For a 1,000-kva. unit at Felton, total cost per kva. was $14.60. Addition of air cooling at a relatively small cost will increase the capacity to 1,250 kva., which would be equivalent to $12.00 per kva.

Savings begin with the minimum of work which needs to be done in design, specification and purchasing. Other economies may be made in the following:

1. Land: For 1,000 kva., ground area could be as small as 25 ft. square.
2. Foundation: If concrete is used, may take only ½ to ¼ as much as conventional station. Steel rails on ties have been used.
3. Fence: Requires only about ½ the usual amount. With some units, no fence is used.
4. Cost of overhead bus and bus structure.
5. Grading and surfacing yard.

In addition, increased capacity by means of forced-air cooling can be secured at reasonable cost, even with the small, three-phase units. The three-phase transformer permits convenient grouping of the cooling coils, so that a minimum of fan equipment is required.

It would seem that consideration should be given to the application of the single-circuit unit substation where:

(1) Emergency service is available in sufficient quantity from other sources.

(2) Distribution layout is such that bus regulation will be satisfactory.

(3) Medium voltage sub-transmission lines are available at or near the proposed site.

(4) A single feeder breaker, when properly supplemented with branch line cut-outs, pole top breakers or other means of localizing line troubles, is sufficient in isolating line faults.

* Abstract of PCEA report.

Short Cuts for Kitchen

Quick service improves this to electrification of kitchen

KING

ADMITTEDLY kitchen planning service is one of the best methods for promoting the electrification of the kitchen and home. However, such service has caused concern in some utilities because the detail involved made the cost of rendering such a service to the public a bit high. Any method by which cost can be reduced and production increased therefore is interesting to those companies conducting kitchen planning service.

Kitchen planning service for the San Joaquin Power Division, Pacific Gas and Electric Co., was carried on by the Valley Electrical Supply Co., its merchandising and cooperative subsidiary. H. H. Courtwright, manager, has decided to give the service much more prominence and the department has been moved to the main floor in an attractive room originally designed as a radio demonstration room. Here Lawrence D. King, formerly of the display department, has been specializing in kitchen planning service. With a display man's knack of devising quick ways of doing things and getting an attractive result, he has developed a number of short cuts which enable him to turn out a complete kitchen plan in less than an hour and a half.

"Draftsmen will probably laugh at my gadgets," says King, "but if they give them a try I'm sure they will find, as I have, that they save me a lot of time."

Instead of a large drawing board, he has made up a small one of heavy fibreboard with heavy bent wire rod as a support and so arranged to give it a slight tilt. On this a sliding ruler marked off in inch-scale is his only T-square. The board is marked in the inch-scale along the edge also. With a small triangle he has sufficient tools in this board to make up a kitchen plan quickly.

It was soon discovered that standard dimensions could be placed on a nicer chart which would serve as a template in the drawing of typical kitchen plans. Therefore he worked out first an elevation chart for wood cabinet kitchen equipment dimensions, another for steel cabinets, and a floor scale. Then he found that many people like a perspective drawing of proposed kitchens. It helps them to visualize it better than an elevation drawing. It took more careful planning but he also developed a perspective chart to be used in making perspective drawings for U-shaped, broken U-shaped, or L-shaped kitchens, as well as one wall kitchen drawn in a perspective of ¾ in. to the foot.

Before drawing up a plan, one of these templates is attached to the small drawing board by means of transparent cellulose tape. A sheet of tracing paper is placed over it and likewise adhered to the template; it is then only a matter of minutes before a plan can be drawn up by extending the standard dimensions shown on the template to the required place in the kitchen.

Salesmen contacting the customers bring in a sheet containing answers to certain basic questions necessary to the draftsmen for laying out the kitchens. On the reverse of this sheet, on squared paper, is a rough outline of the full area of the kitchen as measured by the salesmen. From these two, King is able to make up a drawing quickly. The part that takes the most time, he says, is that of laying out the arrangement of the unit in a rough fashion before actual

NAME _____ ADDRESS _____

CITY _____ DATE _____

SALESMAN _____ **Please Answer All of These Questions**

1. What basic kitchen plan is to be used?
2. When is construction to start?
3. What color is to predominate? Size of Home?
4. New Home? Size of Home?
5. Remodeling Job?
6. Ceiling Height?
7. Window sizes (not casements)?
8. Height of windows from floor?
9. Door sizes?
10. What electrical equipment is to be shown?
    a. Electric Range Make _____ Model # _____
    b. " Refrigerator Make _____ Model # _____
    c. " Dishwasher Make _____ Model # _____
    d. " Water Heater Make _____ Model # _____
    e. " Clock Make _____ Model # _____
    f. " Exhaust Fan Make _____ Model # _____
    g. " Automatic Built-in Washer

Indicate location of dining room and service porch on sketch.
If tracing from plan is sent, these questions must be answered and clipped to tracing.

REMARKS:

Form used by salesmen to list information. A rough sketch of the floor plan is drawn on the back

Planning

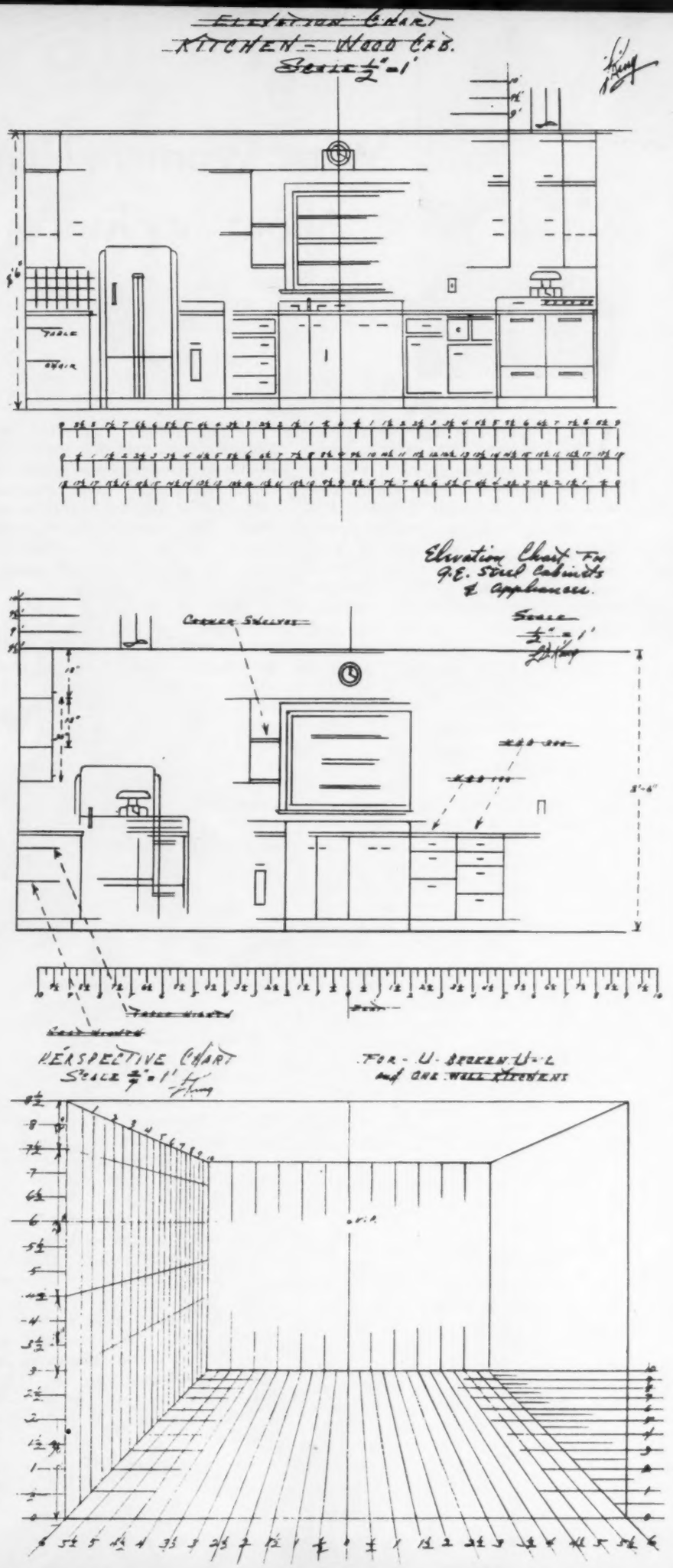
best selling aid and the home

drawing. Once this is done the drawing itself is a matter of a few minutes.

Colored crayons or light water-color wash suggest a color scheme to the prospect and gives attractiveness to the plan. The dimensions as drawn by this manner are sufficiently accurate to guide the quota in arranging a more detailed plan. In most cases they are sufficiently accurate for the carpenters and installers to go to work on the plan itself.

In the new kitchen-planning room pictures of kitchens are ready, planned and installed for customers and copies of attractive plans already made will be used to decorate the walls. Portfolios also will be kept containing photographs and drawings. In this manner, any salesman can bring a customer into the kitchen planning room and from the display on the walls, and portfolios, can tell a complete story on kitchen planning. Field salesmen working through dealers all have a manual containing favorite layouts, a perspective drawing of a kitchen, and other data to help them sell the idea. Builders like the service because it furnishes them with a pretty plan to present to a prospect and they are making more extensive use of this department.

According to Courtwright the value of kitchen planning is far reaching. It gives the utility an opportunity to present its five major services to the customer, that of electric cooking, water heating, adequate lighting, adequate wiring, and house heating. Wiring plans for the complete house are prepared by the lighting division under Jack Hammond. Kitchen planning and wiring planning are coordinated very closely and virtually all the plans made result in an installation very close to that suggested by these two departments.


ELEVATION CHART
KITCHEN — WOOD CAB.
Scale ½"-1'
Elevation Chart For G.E. Steel Cabinets & Appliances
Scale ½" = 1'
PERSPECTIVE CHART
Scale ¾" = 1'
FOR - U - SHAPED U - L and ONE WALL KITCHENS

Three of the time-saving templates are reproduced at the right. As used each one is a blueprint, 8½x11 in. in size. The top one is used for plans where wooden cabinets are to be built; the center where the G.E. steel cabinets and kitchen units are to be installed. The lower template is an aid to quick drawing of a kitchen in perspective, with the vanishing point in the center as indicated. A fourth one, not shown, is a simple floor plan scale with measurements in ¼-in. scale measured from center lines

What Women Think About Appliances

By Shirley Douglass of Sunset*

WOULD you in the electrical business like to know just what women, the buyers of your appliances, think of them? In business these days considerable money and effort are expended to conduct surveys and test consumer reaction. To know just what women buyers of electrical appliances think about them is to know what qualities appeal to her most, what misinformation or ignorance of your products upon which you still have to inform her more thoroughly in your advertising and demonstrations. Just where you are weak or strong and where your competition is strong should be interesting to you.

Not as authorities, but as representatives of our 230,000 subscribers we editors of *Sunset* come to you with such information. We do not depend on our own knowledge or personal viewpoints. We have developed a way to get from our subscribers a steady stream of new home ideas, ways of gardening, recipes, home management ideas and solutions to homemaking questions. This is our editorial raw material, which is supplemented with some advice and thought of our own, and authoritative information from professional experts and manufacturers in the fields that concern our readers.

But it is the reader material insofar as it concerns electricity in the home that I bring you here. In representing this great research force, the homemakers, in that universal laboratory, the home, I must say that we all have one common aim in mind—the improvement of the home.

Let me quote freely from the mail that comes every day. In another column on this page you will find another interesting survey if you want to call it such. *Sunset* shared in the building of two homes by 300 women belonging to a women's club in Berkeley. Every detail was discussed and voted upon. The results of some of those questions voted upon and the reasons given for such votes should be very revealing to appliance merchants and manufacturers.

In our many contributed recipes there are comments that indicate a response to electric cookery and use of electric equipment. Here are a few:

"—and let continue to cook on stored head." This indicates that the value of stored heat is a good selling point, since it is accepted after the range has been tried and proved.

"Make by hand—not possible with an electric beater." Although we may test the recipe, both by hand and with an electric mixer and find that by proper manipulation of the electric mixer it is possible too, it shows that there is something missing in the sale of an electric beater. The way to use it to full advantage is not sufficiently taught the purchaser. Another comment: "Won't you state in the Kitchen Cabinet recipes whether they are for an electric beater or by hand. I use my beater at every opportunity but find that it can't always be used."

From my own personal experience in teaching cooking and demonstrating electric mixers, I feel that individual instruction to the purchaser is best, for once thoroughly acquainted with its use the customer sells her friends through her enthusiasm with her own success.

Here are some conclusions:

1. Women are concerned not with how an appliance does a specific job but how it cuts down her work generally, fits her own house program, eliminates some of her routine. If it is more trouble to assemble or clean up after, she is not interested.

2. There is a great need for more educational work. Those who know how to use equipment correctly are selling it in discussing it with her friends.

3. Women have grasped some of the points made in past advertising. It would be a good idea to stress these and to inform them correctly as to some of their mistaken ideas in future ads. The material we see indicates that women have open minds, willing to hear both sides of the questions placed before them.

* Abstracted from her talk before the Business Development Section, PCEA, both at Long Beach and Oakland, Oct. 13 and 20, respectively.

300 Berkeley Women

decided for *Sunset* how to build a home and with what to equip it. This is how they voted on appliances and why:

•

***"Which do you prefer, electric or gas range—why?"* Electric 36%, gas 55%, not voting 9%.**

***Why electric?*—"Cleaner—dependable — stored heat valuable—safer—economical—more efficient—easier for the cook (have used 10 years)—cheap as gas—kitchen walls don't need washing—just as quick—no gas odors—less smoke—easier to keep clean—gas smelly and dirty—food tastes better because of slower cooking — electric range fits closer to wall, improves appearance of kitchen—absolutely regular heat."**

***Why gas?*—"Cheaper—used to it—quicker—instant heat—faster—more exactly regulated to exact temperature—occasional interruption of current—hired help wasteful with electric stoves — upkeep and repair cheaper—modern range just as clean—I don't like meat roasted in an electric oven—If you burn anything in your oven all the smoke comes out in the kitchen—bakes better."**

***Which do you prefer, an electric, gas or ice box refrigerator? Why?*—Electric 83%, gas 8%, ice 4%, not voting 5%.**

***Why electric?*—"Satisfactory—used to it—more dependable—gas gets stopped up — less trouble — cheap—not familiar with gas."**

***Why gas?*—"Silent—cheaper—doesn't affect radio."**

***Do you want a gas or electric water heater?* Why? Gas 80%, electric 15%, not voting 5%.**

***Why electric?*—"If it is as cheap to operate—if as cheap to replace parts—safer—has no pilot light to go out—don't want two pilots in basement — prefer electricity *always.*"**

***Why gas?*—"Not acquainted with electric—faster—more economical—used to it — current not interrupted—electric water heater exorbitant."**

***Is an electric dishwasher a "must have?" Your opinion*—Yes 9%, no 85%, not voting 6%.**

***Opinions* — "Doesn't do enough of the work—good chore for children—I know nothing about them—I have never used one — not needed in small family—have to wash cooking dishes anyhow—yes, but I would want one that opens at the front like an oven, doesn't break up work surface—not useful—too many gadgets to clean—too expensive for the service rendered—no good for sticky cooking dishes — not so practical, I have heard — more trouble than it's worth—fairly good if many dishes—too expensive — too much trouble to use—require too much rinsing, really washing before putting in dishwasher."**

***Do you want electric accessory heaters anywhere?*—Yes 68%, no 28%, not voting 4%.**

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No. 10-c NOVEMBER 1939

Electrical West

Sales Guide to Sell Electrical Gifts

Most Christmas gifts are bought "out of purse". Electric table appliances are definitely in this class. At Christmas shopping time they compete with the other "out-of-purse" items—stockings, hats, purses, vanity sets, other nicknacks. To turn some of this Christmas budget money toward your electrical tableware there are two simple rules:

(1) **Display continuously**

(2) **Tell them what the appliance does**

(Read inside for more details)

It pays to push the combination sets — toaster and hostess tray, coffee maker and glasses or cups, waffle maker and batter bowls. There is more appeal to the customer and decidedly more profit to you. Even with less volume there is more to be made from every sale. For the really fine Christmas gift, the combination set is tops. Feature it.

Lots of reasons why you will want to feature electric table appliances as Christmas gifts. The same reasons for playing them up all year 'round, for that matter, but extra reasons for the Christmas season:

1. There is profit on the sale, of course.
2. You could sell twice as many without increasing your inventory or overhead.
3. A chance to create new customers.
4. Develop some prospects for the major appliances you sell. Every appliance, major or minor, is a true Christmas gift these days.
5. Help the turnover of your appliance stock.
6. Something you can sell to people of small incomes.
7. Less need to worry over cut-price competition at this season.

It doesn't take any trick stunt or hopeful scheme to promote table appliances, either. A few simple and easy things will work to better advantage. They may be as old as the hills but they will stand up season after season. Turn page and meet your old friends.

What Electric Table Cookery means to You

What to Say

Tell what it

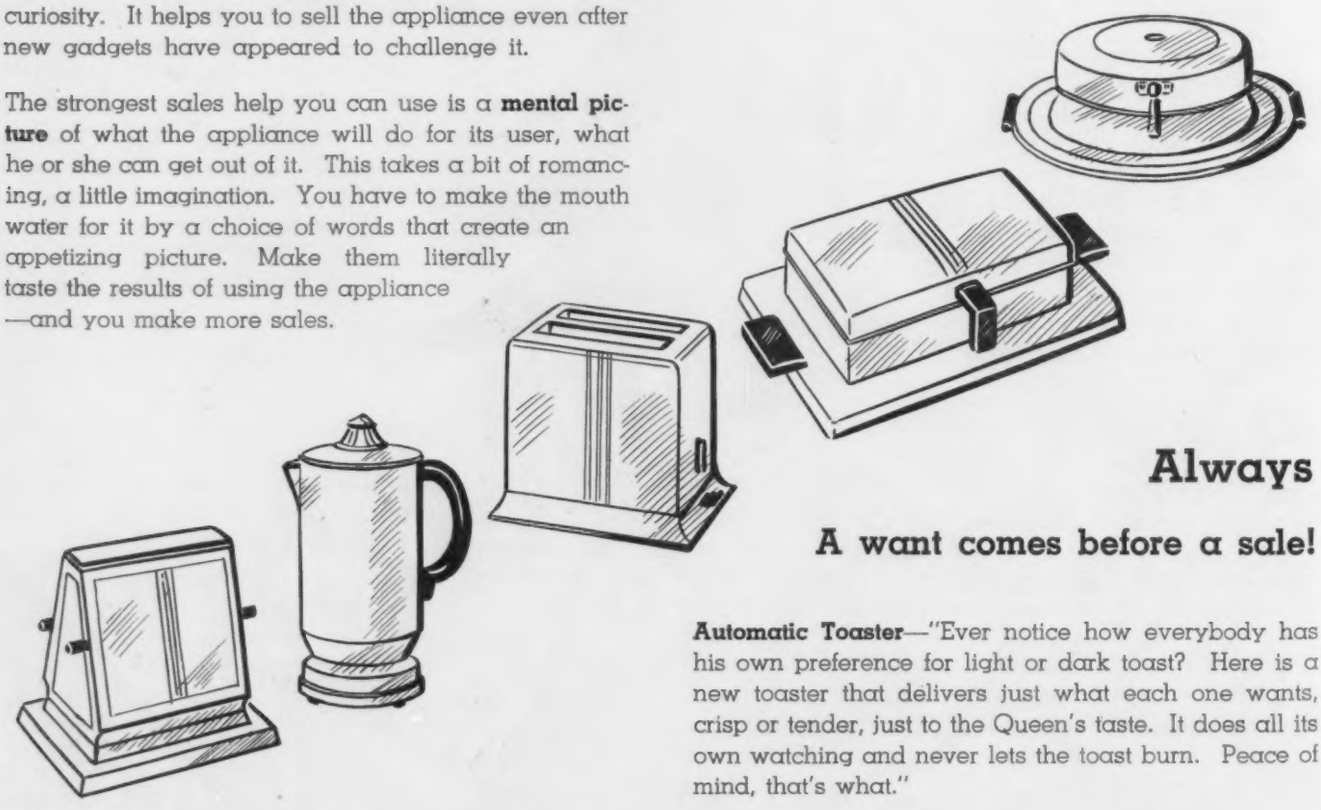
Gadgets have their appeal—especially when they are new. A lot of appliances are sold on their sheer gadget appeal. When the appliance you handle has gadget appeal—go to it. Use it by all means.

But don't forget the use appeal, the benefit appeal. It keeps the appliance sold long after the gadget has lost its novelty. It pushes over the sale many a time when the gadget idea merely fascinates or arouses curiosity. It helps you to sell the appliance even after new gadgets have appeared to challenge it.

The strongest sales help you can use is a **mental picture** of what the appliance will do for its user, what he or she can get out of it. This takes a bit of romancing, a little imagination. You have to make the mouth water for it by a choice of words that create an appetizing picture. Make them literally taste the results of using the appliance —and you make more sales.

If you feel a little bashful on making up pretty phrases, or your mind isn't thinking in terms of romance and appetite—borrow some of these already worded for you on this page.

They let themselves go a little perhaps, but better to be enthusiastic about your appliances than matter-of-fact. If **you** don't care, certainly your customer won't. But if you "get hot" over it, the customer will catch your enthusiasm and want to buy.



Always

A want comes before a sale!

Automatic Toaster—"Ever notice how everybody has his own preference for light or dark toast? Here is a new toaster that delivers just what each one wants, crisp or tender, just to the Queen's taste. It does all its own watching and never lets the toast burn. Peace of mind, that's what."

STAMP OF APPROVAL

Recommended by Your

THE MONTANA POWER CO. • UTAH POWER & LIGHT CO.
IDAHO POWER CO. • CALIFORNIA OREGON POWER CO.

will Do

Make Use of These Want Creators:

Egg Cooker—"Breakfast without leaving the table! And your eggs just as you like them. That's what this attractive little egg cooker means. It's an ornament to the breakfast table, especially this set with the egg cups. Perfect eggs and an attractive breakfast table—that's a combination to start the day off right, don't you think?"

Food Warmer—"How proud you can be of your table when you place this attractive buffet warmer on it and can serve your guests or family right from the table without getting up. Second helpings are kept warm and appetizing too. Or you can serve those informal buffet kind of breakfasts, luncheons, teas or dinners, where everyone can help himself and you can be with your guests having a good time."

Chafing Dish—"Nothing quite so smart as a chafing dish, and now it is made safe and sure by electricity. The flameless electric chafing dish is lovely to look at and it never overheats or burns. It really is the chafing dish of tomorrow."

Casserole—"Can't think of anything that tastes better than a steaming, fragrant, hot and tasty serving from a casserole, right at the table! There's nothing quite like these deep dish casserole concoctions you women make. And here is the modern way to do it, electrically, of course. The oven goodness is here without using the oven, and this electric casserole is attractive on any table, for company or just the family."

Waffle Iron—"Think of the yummy, crisp, golden brown waffles, butter melting over them, delicious to the last bite, that you can make every time with this new waffle iron. Why, you can't have a failure. The automatic control watches the heat for you and turns it off just when it is done. Did you know you could also make cakes, biscuits, cookies and other dainties on this waffle maker too?"

Coffee Maker or Percolator—"Nothing is so delicious as good coffee, coffee that tastes as good as it smells, is there? What a difference there is when you can be sure of that kind of coffee every time! And you can with this more modern, easier to clean, brighter looking, longer lasting coffee maker. Good coffee every time, that's worth millions!"

Sandwich Grill—"Bet you like a snack as well as anybody. Well here's your dish. This little sandwich grill turns out the best tasting toasted sandwiches, or bacon and eggs, or pancakes or a dozen other yummy snacks you ever tasted. It is so handy too—just plug it in and no need to muss in the kitchen. Prepare things right with the guests and family at the table. They'll think you are a wonderful hostess."

to

overcome

low price competition

Sell

Table Cookery

Sales Allies —

PUGET SOUND POWER & LIGHT CO.
PORTLAND GENERAL ELECTRIC CO.
WASHINGTON WATER POWER CO.

What to do—

Keep it Lively

Expose your table appliances to as many people as you can. They are "catching". Put them where there's the most store traffic. Keep them open and available. People like to handle them, and the very fact that they do helps to make them want to own such appliances. One Oregon dealer who kept a lively table of appliances, 3x4 ft. in size, near his wrapping and bill-paying counter, made 14 turnovers a year of his table appliance stock.

Windows can be made to do double-barreled duty, just as well as not. Big stores with plenty of windows don't have the difficulty a dealer with a small store has. If he has one or two windows and handles major appliances, he naturally wants to use them to display these big profit producers. Yet why not make them do double duty? When displaying a refrigerator, put in a few table appliances. Tie in the idea of food saving and food preparation with the appliance. Do this by the text of the window cards.

A major appliance window may have an appeal to 20 of each 1,000 passersby. By putting in table appliances, you interest 100 of each thousand. That increases your dividend from the window without adding much to the expense.

Some dealers use a low shelf, wide enough to display table appliances, right at the window edge. It does not detract from the major appliance display back of it, yet it does keep table appliances active and out front.

Demonstrations—Nothing tops an active demonstration when it comes to creating an appetite for what a table appliance will do. It speaks to your prospect through two powerful factors—taste and smell. It really makes the mouth water. That's why all these smart merchandisers use active demonstrations the year 'round. Especially during Christmas season it is good business to arrange for demonstrations in your store. Advertise them. Make them prominent in local affairs.

Keep things lively—it pays.

—and How

Canadian Exhibit

B. C. Electric Railway stage spectacular show at Vancouver

Adopting an entirely new policy the British Columbia Electric Railway Co. this year decided to present an exhibit at the Canada Pacific Exhibition at Vancouver, which would do a selling job for the entire electrical industry. In the past this firm has concentrated on the development of new leads for its appliance sales department at this Exhibition and has devoted its booth to presentations of the various cleaners, washers, ironers and other lines featured.

This year the utility decided to stage a show which would be spectacular and create good will. The display was arranged in a courtyard which was dominated by a huge lamp with a shade 18 ft. in diameter. The lamp itself stood 22 ft. in height and contained in its base an information bureau. One section of the courtyard was adorned by huge photographs illustrating the right and wrong way of lighting the modern home. Another end of the courtyard was occupied by a home lighting bureau where information on the proper illumination of every room was made available to the public.

One of the special features of the display was the Cinderella kitchen. An antiquated kitchen on one side lent a vivid contrast to the ultra modernly equipped work-shop of the home adjoining. It is estimated that over 10,000 people saw the demonstrations in this kitchen from beginning to end and that another 10,000 saw portions of the presentation.

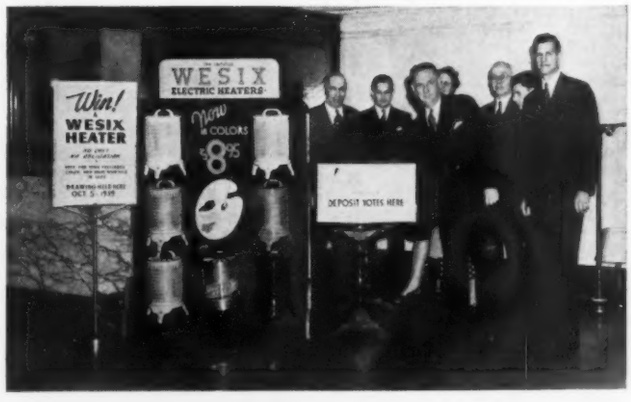
The idea of this year's booth was carried out by Harold Merrilees, sales promotion manager, B. C. Electric. The architectural design of the booth itself is credited to Ken Davis, staff artist of the company, while the actual erection and execution of the scheme was handled under the supervision of Leon Shelley, display specialist.

A 1939 FALL LIGHT CONDITIONING Promotion is scheduled for October, November and December by the Puget Sound Power & Light Co, according to R. W. Clark, merchandise manager. Modelled after the successful 1936-37-38 programs, this IES lamp plan will consist of another prize IES window display contest for IES lamp retailers in Puget Sound territory during October as a curtain raiser. Ultimate aim of promotion is to sell urban and rural customers $250,000 worth of IES lamps by Christmas.

Part of British Columbia Electric Railway electrical industry show held recently

THE 15TH ANNUAL Food and Home Appliance Exposition is all set for the Los Angeles Pan-Pacific Auditorium, where it will be held Oct. 28th-Nov. 5th, under the auspices of the southern California Retail Grocers Assn. Last year's exposition drew 197,673 people. More than 110,000 sq. ft. of display space will be portioned off to exhibitors. Entertainment features include another spectacular Ice Prevue.

COLOR OR ALUMINUM? That was what the Wesix Electric Heater Co. wanted to know. And in a balloting conducted by PG and E last month, votes went 5 to 1 for colored heaters. A display containing all seven Wesix electric heater models was set up near cashiers' windows in the PG and E San Francisco office, where people were urged to "Win a Wesix Heater, vote for your preferred color." Floor salesmen attended the display, to distribute ballots and answer questions. On the closing date, Frank Talcott, division sales manager, drew the name of the winner, Eleanor M. Oliviera, San Francisco.



Headquarters for the Wesix Heater color preference contest conducted recently was set up in PG and E San Francisco offices. Here Frank Talcott is shown drawing prize ticket from the ballot box

School Days

Electrical League of Utah sponsor appliance course

Salesmen are learning how to sell more effectively in Salt Lake City. The Electrical League of Utah is sponsoring a practical course in electrical appliance salesmanship in which are enrolled more than fifty students. Begun Oct. 15, and held in the *Tribune-Telegram* auditorium, the course is conducted by the Salt Lake City Public Schools department of adult education and made possible by the George Deen Act.

The cost of the course, according to the Sales Advisory Committee of the League, is trivial, amounting to less than 10c per lesson. Individuals over 16 years of age actively engaged in the electrical industry are eligible to take the course. At the conclusion a certificate of merit will be given to those who complete the course in a satisfactory manner.

Instruction consists of a discussion of the salesman himself, how to determine the various types of customers, strategy in handling people, factors entering into salesmanship, the art of oral persuasion along with many other topics to be discussed by instructors, who will be qualified to fuse theory with practice in presenting their material.

JOINING TOGETHER to make a big display of electrical appliances at the Fresno district Fair, dealers in Fresno grouped themselves about the Valley Electrical Supply Co.'s portable kitchen and dominated the exhibit building. Exhibitors were Hackett Cowan Co., Fisher-Glassford Hardware Co., Kramers, Bufords, Barker Furniture Co., McMahons, and the Fresno Bee Broadcasting Studio. The Valley Electrical Supply Co. kitchen operates through a dealer merchandising plan of San Joaquin Power Division, P G & E.

Sales Programs

Pre-Christmas promotion begun By Western utilities

Special emphasis is being put on electrical gift buying this year, including major appliances, according to reports from many of the sales departments of western utilities and bureaus.

British Columbia Electric Railway Co., Ltd., —Special activity on auxiliary heater sales in Nov. with electrical gift buying promotion for Dec.

Coast Counties Gas & Electric Co., Range and water heater campaign for Nov. and Dec. with exhibits at two county fairs. Water heater sales include installation; aluminum ware given with ranges.

Denver Dealer Activities—Home laundry equipment, IES lamps, commercial lighting, adequate wiring campaigns in Nov. and Dec. with electrical exposition, Christmas lighting of residential districts.

Los Angeles Bureau of Power & Light—Range campaigns for Nov. and Dec. Food show and local dealer expositions in Nov. and Dec.

Mountain States Power Co.—Lamp bulbs and IES lamps campaign for Nov.

Nev.-Calif. Electric Corp.—Range and water heater campaigns for Nov. and Dec.

Portland General Electric Co.—Water heater campaign for Nov. with "Electrical Christmas" drive for Dec.

Puget Sound Power & Light Co.—Range, water-heating and light conditioning campaigns for Nov. and Dec. Light conditioning campaign undertaken on all-industry basis, emphasizing opportunity for profit to dealers.

San Diego County Bureau of Radio & Electrical Appliances—Seventh Annual Electrical Show scheduled for Nov. 28-Dec. 3d.

City of Seattle Light & Power—Light conditioning and range campaign for Nov. and Dec. Specialized crew selling IES lamps. Range cooking demonstrations and special advertising in newspapers on Better Light, Better Sight.

Southern Colorado Power Co. Light Conditioning and range campaigns for Nov. and Dec.

Southwestern Public Service Co., IES lamps campaign for Nov.

Utah Power & Light Co.—Lamps, fixtures, range, water heating, commercial lighting campaigns for Nov. and Dec. Commercial and industrial lighting exhibit to travel to all divisions in Nov.

Valley Electrical Supply Co.—IES lamps campaign in Nov. Christmas appliances for Dec. Dealers will display special Christmas gift appliance.

Washington Water Power Co.—Lighting, range and water heater campaign for Nov. and Dec.

Western Colorado Power Co.—IES lamps, range and water heater campaigns for Nov. and IES lamp campaign for Dec.

Western Public Service Co.—Pin-it-up lamps and IES lamp activity for Nov. and Dec.

THREE HIGH MEN in the six months commercial light conditioning campaign conducted by the Puget Sound Power & Light Co., were Bert Heinz, Seattle, who was awarded first prize; Fritz Fall, Seattle, second prize, and Clarence Scheyer, Chehallis, third prize. Each man won a trip to the recent IES convention and the San Francisco Fair.

IES LAMP ADVERTISEMENTS have been dotting the newspapers of the Pacific Coast, presenting the IES story effectively and convincingly. "Get Your IES Lamp Now," urge the ads, "new beauty—new styles—more useful light!" Copy asks that customers be sure they get the IES certificate of compliance that is tied to each IES lamp. Illustrations of nine types are offered, proving that IES lamps are not only an ideal lamp for seeing but for a decorative piece as well.

APPLIANCE SALES REPORT, 1939

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

REPORTING COMPANIES	Idaho Power Co.[1]		Northwestern Elec. Co.[2]		Montana Power Co.[3]		P. G. & E. Co.[4]		San Diego Cons G. & E. Corp.[5]		San Joaquin Power[6]		Southern Calif. Edison Co., Ltd.[7]		Utah Power & Lt. Co.[8]		Wash. Water Power Co.	
	Current	9 Mos.	Current	†Mos.	Current	†Mos.	Current	8 Mos.	Current	†Mos.	Current	9 Mos.	Current	9 Mos.	Current	†Months	Current	8 Mos.
Ranges	354	2 806					328	2,605			136	1,044	167	1,543			278	1,606
Water Heaters	125	1,345					215	1,960			59	533	53	579			348	1,307
Air Heaters, aux.							78	739										
Air Heaters, 220							93	2,283			44	445						
Refrigerators	242	4,313					3,692	33,112			311	4,885	3,346	29,712			732	6,304
Dishwashers	2	18					17	102			1	22						3
Washers	397	3,636					2,712	21,108			376	2,877	2,486	19,953			483	3,681
Ironers	18	271					539	3,743			46	389	315	2,441			34	230
Vacuum Cleaners	90	1,181					2,388	20,685			80	767	856	9,199			220	1,727
Radios	975	5 687					9,079	69,872			816	5,135	5,498	38,945			1,718	10,845
Mixers	73	522					269	2,104			36	344	220	2,055			115	882
Cookers, Casseroles	38	288									3	36	33	351			395	2,375
Irons	606	4,324									272	2,339	925	9,081			781	4,853
Waffle Irons	140	1,018									55	658	251	2,668			167	1,198
Toasters	299	1,877									101	1,013	506	4,233			365	2,771
Table Stoves	301	2,796									20	223	148	1,719			252	1,090
Heating Pads	82	593									17	266	70	1,169			64	587
Curling Irons													24	329				
Coffee Makers	206	1,723									104	1,063	238	2,333			361	2,754
Sewing Machines							478	3,637			22	101					91	618
Clocks	153	1,134									115	1,139	410	3,996			270	1,661
Fans	94	2 017									49	736	1,471	3 323			555	2,668
Floor Polishers																		
Sun Lamps	10	158											16	290			7	85
Reflector Lamps																		
Misc. Lamps																		
Shavers													156	1,750				
Yard Lights											45	396						

SOURCES

[1] Figures compiled by Electric Equipment Sales Association. Include power company sales of all reporting dealers.

[2] Lists appliances sold by dealers in Portland area. Figures compiled by Northwestern Electric Company.

[3] Combined dealer and company sales from report of Montana Power Co.

[4] P. G. & E. reports sales of major appliances only based on accurate reports from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. [8] Due to delays in compiling report current and total figures are always one month behind those figures of companies reported in other columns of this table.

[5] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Miscellaneous figures includes fans, curling irons and sun lamps.

[6] Compiled from dealer reports by Merchandising Division of San Joaquin Power.

[7] Includes reports from dealers on San Joaquin Valley system of company as well as Southern California areas served.

[8] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.

† September figures were not available at time of going to press.

PCEA Long Beach Sessions Show Industry is Alert

THAT the electrical industry is anything but static was the conclusion of 375 participants in the varied discussions of engineering, operating, administrative and sales problems at the annual southern fall conclave of the PCEA held at Long Beach, Oct. 12-13. Sixteen discussion groups ran the gamut of subjects from lighting to employee training and customer relations. In addition there were two luncheon meetings at which W. C. Mullendore, Edison executive vice-president, made an inspirational plea for greater individual attention to the affairs of government and Frank P. Doherty, Los Angeles attorney, warned of the dangers of "30 Thursday." Summaries of the group discussions follow:

Business Development Section

Lighting (G. M. Rankin, So. Cal. Ed., sponsor)—That the school lighting field merits greater sales development was shown by a comparison of actual conditions to the standards proposed by IES. In recent months 83 school lighting installations in southern California have been equipped with photo-cell control. The question of proper blackboard lighting is coming to the fore and warrants special attention from lighting engineers.

New light sources are revolutionizing commercial lighting. Never before has the commercial lighting engineer had a better story to take to the store owner, building operator or the industrial plant. The time is not distant when intensities of the order of outdoor daylight will be demanded indoors. Greatest stumbling block to increased lighting intensity in commercial establishments is wiring. It is to be hoped that the new wiring materials and techniques will bring partial relief. Selling a rewiring job to assure adequacy is the most difficult phase of commercial lighting promotion.

Light conditioning in the home has tremendous public appeal when equipment is properly demonstrated. New home lighting equipment literally "stole the show" when demonstrated at a recent cooking school. One southern utility set a quota of 3,000 home lighting sets for a recent campaign and exceeded that figure in the first three weeks.

Wiring (C. A. Rowley, Thermador Elec. Mfg. Co., sponsor)—Discussions brought out several weak spots in the telling of the adequate wiring story. Unsold are home financing agencies, architectural services and building contractors. In southern California 83% of the new homes are speculative where the building contractor controls the wiring adequacy.

Recommended were classes outlining for apprentice wiremen the industry advantages of adequate wiring. Also proposed was the preparation of standard wiring plans and specifications for architects and architectural services which would incorporate different wiring systems, i.e., knob and tube, conduit, and flexible conductor. A suggestion was offered that the national AWB symbol and the Red Seal symbol be merged in those areas where Red Seal has received sustained sales effort so as to capitalize upon the AWB national promotion.

Power (P. P. Pine, San Diego Con. G. & E., sponsor)—Following the publication of the PCEA power sales handbook now on the press, this group will issue a series of factual data sheets on typical Western power applications. Emphasis was placed on the necessity for preparing rules covering the installation and rating of welding and therapeutic equipment. Data are being prepared on competitive power installations, particularly on the useful life of such equipment. Announcement was made that the PCEA agricultural power sales handbook would be available by Nov. 1.

Small Appliances (H. C. Rice, So. Cal. Ed., sponsor)—Discussions brought out that only meager data are available on the retail channels through which small appliances are sold, that the percentages sold through various channels have changed in recent years. Shorter lines, particularly of laundry equipment and refrigerators, were urged. Dealers need more education on the effective use of sales promotional material now supplied them, one speaker claimed. Obsolescence has an important bearing on commonly accepted saturation figures; for instance surveys show an approximate 100% saturation of electric irons, yet only 40% of these are automatic. Recommended was an enlarged program of appliances shows to acquaint the public with new developments.

Heavy Duty Appliances (W. E. Cranston, Thermador Elec. Mfg. Co., sponsor)—Two recommendations came out of these discussions: (1) that study be

On the southern conclave program were these electrical industry notables: Top is W. C. Mullendore, Edison executive vice-president, who inspiringly outlined the plight of "The Bewildered American." Center is Fred Hanson, Pacific Gas and Electric purchasing agent who sponsored the purchasing and stores discussions. Bottom is N. B. Hinson, Edison chief engineer, who outlined some of the advantages of the proposed code changes

given to the development of portable entrance service and wiring equipment that would permit range demonstrations on the customer's premises, and (2) that general industry employee education on the advantages of ranges and water heaters be intensified. Among range wiring developments described was the new policy of the City of Banning of including $25 for wiring in the price of the range and then rebating this amount on the electric bill at the rate of $1 per month.

Air Conditioning (H. H. Douglas, So. Cal. Ed., sponsor) — Announced was the completion of an exhaustive survey on climatological conditions affecting air conditioning for PCEA territory. This has been published and is now available.

Petroleum Electrification (J. P. Kastl, PG&E, sponsor)—Described were the first successful tests of the application of electric heating to increase oil well production. A 15-kw. installation was tried out on different low-production wells and resulted in doubling the amount of oil pumped.

"What 230,000 Western Homemakers Ask About Electrical Appliances" was discussed by Shirley Douglass, foods editor of *Sunset* magazine, at a general session of the Business Development Section. Miss Douglass emphasized the need for more consumer education in the use of appliances, particularly individual demonstration. Among her suggestions was that a foot-operated switch be installed to control lights in basements. Also she summarized the answers of 300 housewives to questions about electrical appliances asked in connection with the construction of a new home in Berkeley. These are reported elsewhere in this issue. On the same program was a skit showing how the new agricultural power handbook might be used.

The proposed EEI eight-point wiring program was reviewed by N. B. Hinson, Edison chief engineer, with particular reference to the provisions which would simplify installation and increase wiring adequacy. Hinson pointed out that although domestic consumption had increased 85% during the past decade, the average copper capacity in the home had only increased 10%. With 1,500,000 homes in California built a decade or more ago, there exists a wiring modernization market in excess of $45,000,000 he estimated.

Operating Economics Section

Production and Substation Group (T. C. Stavert, So. Cal. Ed., sponsor)—Latest trends in waterwheel modernization and maintenance were outlined, including the use of electric welding in several new fields. Possible efficiency increases through the application of recently developed impulse wheel buckets were considered. In a discussion of manual vs. automatic starting of rotating equipment, divergent opinions and practices were aired. It was agreed that automatic starting was desirable and successful as applied to large hydroelectric units but that such was not the case with synchronous condensers.

An empirical method of pre-determining the performance of steam turbogenerators when subjected to high-speed load pickup was described by F. G. Philo, So. Cal. Ed., who showed studies for the 100,000-kw. Long Beach units and then demonstrated how these checked against actual performance. He also described a magnetic device for controlling governor operation actuated by one-half cycle variations in frequency.

Transmission and Distribution Group (W. B. Loper, Nev-Cal Elec. Corp., sponsor)—The increasing use of pole-top condensers for power factor correction was emphasized and several examples cited. Concern was expressed over poor power factor conditions on distribution feeders serving residential load where saturation of refrigerators and air conditioning units was high. Latest developments in unit substations were described and possible applications of this equipment considered. Considerable discussion was devoted to new developments in lighting protection equipment and its use. Experiences were cited of system disturbances resulting from the recent unusual lightning storms which occurred over much of California.

These men direct the activities of the three PCEA sections: Left to right: Allen G. Jones, General Electric Co., chairman, and H. A. Lott, Southern California Edison Co., vice-chairman of the operating Economics Section. E. G. Stahl, sales manager, San Joaquin Power Division P. G. & E., vice-chairman, and F. C. Todt, Los Angeles manager, General Electric Supply Corp., chairman, of the Business Development Section. E. A. Long, P. G. & E., vice-chairman, and M. W. Phillips, Visalia division manager, Southern California Edison Co., chairman, Administrative Services Section

Metering Group (A. S. Irion, Co. Cal. Ed., sponsor)—Results of preliminary comparative tests of 5- and 15-amp. meters on loads ranging from 1 to 400% were reported in connection with a discussion on the substitution of the new 15-amp. meter for the usual 5-amp. type. Developments of new equipment for metering low power factor and intermittent and distorted wave shaped loads were described and the fact that additional research is needed was emphasized. The relationship between test periods and meter accuracy was reviewed and an analysis of the results of 900,000 meter tests presented. These showed that on a 5-year test basis, 92% of the meters operated within the desired accuracy limits. As the test period was extended the degree of accuracy decreased.

How electric drive is expanding in the petroleum industry was described in a paper by L. S. Peterman, So. Cal. Ed. before the entire section. Predictions on future loads, with special reference to load characteristics were made by R. A. Hopkins, Westinghouse.

Administrative Services Section

Various phases of administrative operation were reviewed by this group. It was agreed to close discussions on cooperation between utilities in followup collection of delinquent accounts. For the time the possibilities of public re-

Active in southern conclave discussions were these men: Left to right, George Bigelow, commercial manager, Nevada-California Electric Corp.; Charles Grunsky, chief engineer, Coast Counties Gas & Electric Co.; H. C. Rice, merchandise manager, Southern California Edison Co.; G. H. P. Dellman, lighting engineer, San Diego Consolidated Gas & Electric Co.; R. C. McFadden, Edison general commercial manager, and J. P. McElroy, San Joaquin Power Division, P G & E.

lations audits have also been exhausted, particularly since the compilation of a complete report outlining the practices of Coast companies. Consideration was given to recent regulations both by state authorities and the ICC on the operation of motor vehicles.

The purchasing and stores groups passed a resolution urging that manufacturers consider simplification and standardization of catalog and data sheet material. This group also recommended the adoption of the new EEI standards with respect to certain classes of poleline hardware.

Revived after several years was a committee to coordinate the interests and activities of women in the industry. Women from several companies participated in discussions and in addition held a special dinner meeting.

How to achieve better service through employee training brought forth lively discussions. Related industries contributed from their experience. J. P. Gifford, Union Oil Co.; P. D. McCarthy, So. Calif. Tel. Co., and R. A. Von Hake, Lockheed Aircraft Co., told of the programs their companies use for the selection and training of employees.

Northern Section

FIRST meeting in Oakland in 23 years was fortuitous; it discovered a mayor who welcomed the conclave with a declaration of belief in the superiority of the enterprise system of business over that where government attempts business functions; it brought out an all-time record attendance of 438. C. R. Doerr, P G and E, was in charge of arrangements.

Two luncheons were addressed by A. J. Lundberg, president of Key System railway and of the Oakland Chamber of Commerce, and by James Mussatti, general manager, California State Chamber of Commerce. Lundberg quickly and devastatingly dissected the "Ham and Eggs" proposition on which California votes Nov. 7, illustrating by clear-cut exposure its implied dangers both to the financial soundness and the political freedom of that state.

Mussatti spoke inspiringly of the reasons for which the framers of the U. S. constitution selected the enterprise system rather than the totalitarian system for the government of the Unied States.

The Administrative Service Section activities in this northern conclave differed from those reported from Long Beach. Women's committee activities may soon see revival, judged by the plans made in a dinner meeting during the conclave.

Operating Economics Section

Production and Substation Group (E. F. Maryatt, PG and E, sponsor)—E. A. Crellin, PG and E, comprehensively outlined maintenance progress, emphasized the need of co-ordinating maintenance work with the time for water conservation. Ray Quick, Pelton Water Wheel, described modern practices in South America as well as locally. Heat treated buckets are favored in Europe, he said.

As at Long Beach, most considered automatic operation desirable principally for starting hydro units. Equipment was reported highly reliable. W. R. Baker, PG and E, reported a full automatic railroad station had operated 16 years with but three interruptions through failure of equipment to operate. Necessity for skilled supervision was emphasized.

Quick pick-up by steam again led into the subject of automatic control. Discussion leader V. F. Estcourt, PG and E, said automatic equipment is essential to the modern steam plant, that control should be centralized, manual and automatic control kept independent.

Transmission and Distribution Group (E. M. Wright, PG and E, sponsor)—C. G. Smith, PG and E, discussed power-factor correction by shunt capacitors in detail, mentioned that each kva. released at the substation is nominally worth $26, but that indirect considerations usually reduce this to an average of $13. Discussion was plentiful, many particular cases being analyzed and enthusiasm for capacitor usage being general. J. B. Madden, PG and E, suggested tye desirability of capacitors on underground systems.

Unit substation discussions brought forth a warning against a thousand and one different arrangements being brought into use. It was urged that standardization be sought, in order to bring about the savings inherent in mass production. Emphasis was placed on appearance, and on the desirability of equipping units with cable connections. Continued study will center around (1) standardization. (2) to what extent refinements should be extended or eliminated.

Recent lightning storms in California lent point to the talk of Walter Smith, G-E, who discussed protective apparatus and extent of lightning throughout the country. General protection of California systems was not considered justifiable. The fact that the 2,300-volt distribution transformer now gets 26-kv. impulse strength was given as one reason why damage is diminishing.

Metering Group (C. F. Gilchrest, PG and E., sponsor) — There was agreement that the 15-amp. meter is to become the major item for single-phase domestic service. George Searle presented a new analysis of earlier data on meter accuracy as affected by test periods. Conclusion was that even a 10-year test period for small meters cannot be justified economically, although other considerations probably should be applied in determining test period. H. D. Noren, Coast Counties G & E presented the view that low power factor, intermittent loads, distorted wave shapes generally introduce only small metering errors.

General Meeting—The fact that engineers must henceforward share the job of keeping the electric industry alive and growing was emphasized by Section Chairman A. G. Jones, G-E, who spoke on load growth in the five years just ahead. Pointing out that there is every evidence that electricity is the last word as a medium of energy transmission, he said there is no indication that present methods of selling and exploiting electricity are so perfect they will experience no change. Lt. Col. L. H. Stanford reported on results of the air raid warning tests, in which utility communications played a vital part. Performance of utility equipment and personnel, he indicated, left little to be desired.

Business Development Section

Lighting (L. A. Hobbs, Smoot-Holman Co., sponsor) — Effort is to be made to enlist the support of Parent-Teacher, eye specialist, Sight Conservation Council and other groups to work for a state school lighting code. Fluorescent lighting must have power-factor correction and needs to be sold less on its watt-saving basis than for its own worth. The trend away from ceiling outlets in living rooms is holding back the development of better domestic lighting equipment by now enlightened fixture manufacturers. Education to get the outlet back into plans is needed.

At the joint meeting with the wiring group, office building modernization and code changes were talked. Only 300 northern California office buildings are adequate in wiring and lighting; all others obsolete. Modernization brings 25 to 100% better rentals or prevents loss of good tenants. Of office building modernizing a third is spent in electrical work.

Wiring (J. O. Dillingham, G. E. Co., sponsor) — Standardized services

as a means of selling 100 per cent adequacy for residences, the Guidance Committee was asked to study further. Contractor participation in adequate wiring promotion was shown to hinge on deep fundamental economic situations. More progress can be made with speculative builders by assisting them to dramatize and visualize adequate wiring as a sales feature. Most important men in banks and loaning agencies needing to be informed on the value of adequate wiring are the appraisers, the group was told. Despite the variety of lines and sales stories they must carry wholesalers salesmen could take pithy, short adequate wiring messages to contractors and dealers on their calls if prepared by the association.

Journeymen electricians were disclosed as a potent potential selling force if their interests in the job value of adequate wiring are aroused through educational work. P.C.E.B., Northern Division work along these lines, with unions and apprentice classes has borne this out. The Red Seal and Adequate Wiring symbols can be brought closer together through a revision of the Red Seal booklet and other means.

Power (W. P. L'Hommedieu, Westinghouse E. & M. Co., sponsor)—Power salesmen will soon have a new selling tool, a handbook based on western power applications; also current data sheets covering unique applications. Competitive installations are being studied, data compiled as to their success or failure so that use of them can be made in competitive situations.

Big job of the air conditioning men has been finished. They have compiled a detailed report on California climatic conditions by regions as a guide to the installation only of the proper kind in each region. Two years work is represented in this study.

Small Appliance (O. R. Doerr, P. G. and E. Co., sponsor)—The Modern Kitchen Bureau will be asked to prepare a booklet containing the selling story on the uses of table appliances, clocks, fans, and other traffic appliances. A recipe book needs to be developed for newspaper, magazine and retail store publicity. Colored display helps should be designed to tie in with the currently featured appliances. Two campaigns on automatic electric irons are also asked for to reach the users of non-automatic irons, (approximately 60% of the market).

Home laundry equipment requires more sales training, with strong emphasis on home demonstrations. Manufacturers should aid in providing these because of the demoralized market with profits cut to the vanishing point.

Electric refrigeration is beset by two sales problems—that of the replacement market and the low income market, which requires long terms. About a third of wired homes still use ice or nothing, 600,000 potential customers. Half are such poor risk as to be eliminated; 300,000 need a special sales plan fitted to their day-to-day living, rather than month-to-month. It was recommended that a permanent committee of three to five members study the replacement market, especially central reconditioning plants. A test area, probably Oakland, was urged as a trial to find out whether a reconditioning plants in which manufacturers, distributors and dealers join, can solve

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the problems both of trade-ins and of reaching the lower income market.

Range, Water Heater and Air Heater (W. E. Cranston, Thermador Electric Mfg. Co., sponsor)—The residence demand and diversity factor committee recommended that one or several groups, totaling 200 homes, be studied for peak demands on wiring and service conductors to determine adequacy of wiring codes in prescribing for home electrification. Such information furnished the electrical inspectors would help them in designing better codes. Another study was also recommended —that of load diversity so as to learn definitely the cost of serving various types of domestic loads.

Joint Meeting

As at the Long Beach conclave the enitre Business Development Section met in a final session to hear the presentation of the revised Agricultural Power Handbook by means of a dramatized and illustrated skit, and to listen to Mrs. Shirley Douglass, food editor of Sunset magazine, tell what women readers had reported to Sunset as their reactions to electrical appliances. Then the Operating Economics Section joined the group as N. B. Hinson, So. Cal. Edison Co. reviewed the proposed changes to the National Electrical Code made by the Edison Electric Institute.

Agenda

Leagues and clubs report active sessions in Pacific West

Western electrical leagues and associations continue to make the fall a busy time for their many constructive and creative promotions nad programs. Here are a few that reported their news:

Air Conditioning Society, San Francisco—Last met at Bellevue Hotel Sept. 28th to hear Prof. L. M. K. Boelter, Engineering Dept. of Univ. of California. His subject: Additional Material on Water Cooling. R. B. Holland is president of this organization.

East Bay Electric Club—Met Oct. 9 in Oakland for luncheon. Oct. 16 Jack Ober talked on "Deputy County Treasurer and Inheritance Tax Appraiser's Experiences in Opening Sealed Safety Deposit Boxes." Ed Touraine is secretary-treasurer with Lew Galbraith, president.

Rocky Mountain Electrical League—regular luncheons resumed Oct. 9 at Denver Athletic Club. Plans for customary pre-Christmas program put under way.

Santa Barbara Chapter, NECA—Meetings held Oct. 12, 26, 30 and Nov. 9 with talks by Dr. H. H. Allison, and Dr. F. P. Woellner.

Southern California, Chapter, EMAA—Met Oct. 17 for dinner in Los Angeles together with members of IES. "Inspection Lighting" was topic of evening, discussed by Frank Hansen, director Western Institute of Light & Vision.

Southern California Chapter, IES—Chairman-elect Henry B. "Hap" May, Jr., announced following committee chairmen for 1939-40. Programs and papers, Foster K. Samson; Membership, William T. German; Attendance and Fellowship, L. M. "Monte" Watson; Publicity, George M. Rankin; Lighting Education, Frank A. Hansen; Street and Highway Lighting, William E. Lauer; Residential Lighting, C. E. Merryweather; Industrial Lighting, Urban L. Beh; Commercial Lighting, Herbert J. Mayo; School Lighting, Edward F. Reynolds; Society Interrelations, R. A. Crosby; San Diego County. A. I. Benedict, State of Arizona, George A. Hill.

Southern California Chapter, IAEI—Meeting scheduled for Nov. 15 in City Hall. Inspector problems to be discussed.

Victoria Electrical Assn.—Meetings to be held second Tuesday of each month during the winter, according to A. R. Colby, Secretary. Will be arranged in auditorium of the main Victoria showroom of British Columbia Elec. Railway Co.

Electric Club of Washington—Meeting Oct. 9. Special observance held of Fire Prevention Week, Oct. 8-14.

NEWA Meeting

Pacific division gathers in Canadian city to discuss problems

That Victoria, B. C., would be the scene of another early convention of the Pacific Division, NEWA, was the conclusion reached by the 70 who attended the successful fall meeting in that city Oct. 5-7. Twelve years had intervened since the last wholesalers' meeting in Victoria. Two open sessions heard four speakers outline current problems of the electrical industry.

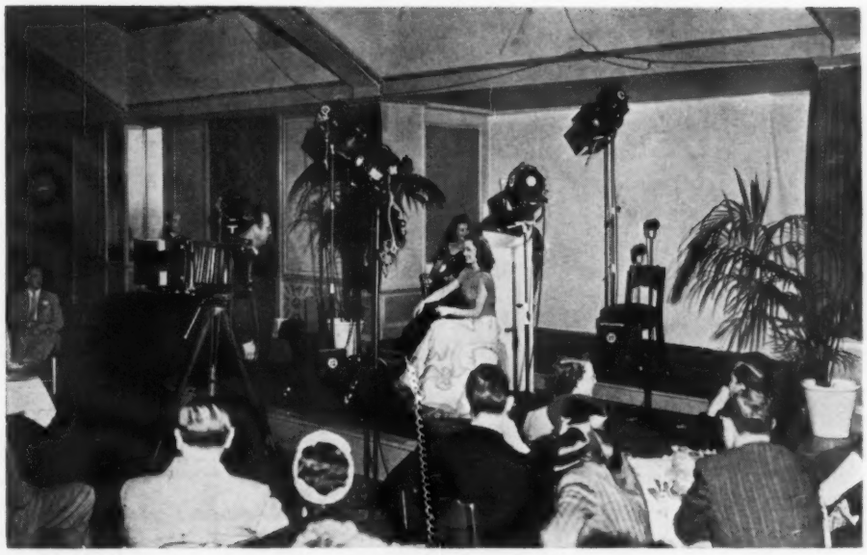
L. R. Wilson, G-E lamp department Northwest manager, told how the development and public acceptance of more expensive lamps was bringing the electrical contractor and dealer back into the picture, largely because the sales of such lamps frequently led to the sale of auxiliary equipment and wiring jobs. The lighting market is full of promise and profits for the whole industry, he declared. W. O. Smith, G-E Supply Corp. merchandising manager from Salt Lake, outlined the relationship existing between the wholesaler and the utilities, stressing the assistance the former can render in promoting better public relations.

"Regardless of rates, the sale of appliances has always been a doorbell ringing job and it will continue as such," Kinsey M. Robinson, president, Washington Water Power Co., told the group in discussing the relationship between the existing utilities and the federal power projects in the Northwest. Rates and consumption in the Northwest have been developed to the point, he said, where there is little inducement that government ownership can offer the public. He emphasized the point that low rates of themselves will not sell appliances. Based upon past experience, he declared, a public investment of $750,000,000 in electrical utilization equipment would be required to utilize the full power resources of the Bonneville and Grand Coulee projects.

Taking as his theme "The Answer Is More Sales," W. C. Mainwaring, B. C. Electric sales manager, stressed the importance of market development. He stated that obsolete equipment now in use represented one of the greatest competitive obstacles confronting the industry. He touched on the value of dealer cooperation, the importance of adequate wiring, the need for training in salesmanship, and the value of kitchen planning with respect to developing more sales.

In the golf tournament the Copper Cup was won by M. H. Jankelson, Incandescent Supply Co., San Francisco. A. M. Bauer, Bryant Electric Co., Seattle won the manufacturers' cup; W. E. Wallace, General Cable Co., Seattle, the Clendenin trophy and W. Mearns, B. C. Electric, Victoria, the central station cup. The tournament was played on the famous Royal Coldwood course.

F. C. Todt, Los Angeles G-E Supply district manager, new chairman of the Pacific division, announced that the annual winter meeting will be held at Hotel Del Monte, Feb. 15-17, 1940.



Gene Kornman, 20th Century-Fox portrait artist, is shown here at the recent IES meeting in Los Angeles, displaying a new technique in lighting, using only one baby keg light. June Gale, pretty motion picture star, is having her picture taken under the new lights

L. B. STACEY, Packard Electric, has been elected president of the Vancouver Electric Club and will preside over the fall sessions of the club. Stacey has served on the executive of the organization in divers capacities. George Knowles, Canadian Telephone & Supplies Ltd., was elected vice-president; R. A. Benson, Canada Wire & Cable Co., secretary, and F. Bolton, Canadian General Electric Co., treasurer. The regular Friday luncheons of the club have now been suspended for the summer months and will be resumed in September. The resumption of activities will be marked by the annual golf tournament of the industry which is organized each year by the Electric Club.

ELECTRICAL DEALERS comprising the Electrical Equipment Sales Assn. of the Idaho Power Co., spent the latter part of September learning more about light conditioning. Harold Green of the Mazda Lamp Division conducted meetings at Boise, Pocatello and Twin Falls for the purpose of instructing dealers and their salespeople in the science of light conditioning. The association's adequate wiring bureau also took part in fire prevention week in Boise the week of Oct. 8-14.

Electric Club Elects

Chamberlin named to succeed Muffley as Washington club head

D. U. Chamberlin, president of the Globe Electric Co., Seattle, has been named to succeed R. U. Muffley, of the Puget Sound Power & Light Co., as president of the Electric Club of Washington.

Other officers named at the voting session were B. B. Blake, manager of the Seattle office of the Westinghouse Elec. & Mfg. Co., 1st vice president; James H. Kelly, Graybar Electric Co., 2nd vice president. Blake succeeds Chamberlin and Kelly succeeds Wm. Humason, of the Western Union Telegraph Co. Charley Allison and Wm. H. Flood, of the Puget Sound Power & Light Co., were renamed treasurer and secretary.

New trustees named were Chris Hawkes, Electric Storage Battery Co.; Tom Widrig, Trumbull Electric Mfg. Co. and W. H. Gaunt, Electrical Workers Union, Local 46. J. J. Agutter is the holdover trustee, and Muffley, as a retiring president will also serve on the board of trustees.

NORMA NEWTON, Los Angeles Bureau of Power & Light home economist, known professionally as Ann Martin, has been elected president of the American Home Economics Assn., southern California section. She recently returned from San Antonio, Tex., where she attended the national convention of the organization.

Science of Seeing New Aid To Better Sight In Schools

"FIND the cause before applying the cure" is good, sound sense. It is also sound engineering procedure. The prime need of the present time is to find out more about seeing. That comes first. How to apply the light which seeing demands can better be developed when more is known of seeing. In his lectures to teachers' institutes and other organized school groups during the past two years, Clark Baker, executive secretary of the Sight Conservation Council of northern California, and lighting counselor, Pacific Coast Electrical Bureau, Northern Division, invited the teachers to write to him any questions occurring to them about seeing and eyesight. The questions were to be those which his lectures and previous study still left unanswered in their minds.

The science of seeing, Dr. Matthew Luckiesh told the Illuminating Engineering Society convention, is slowly finding the basic facts relative to eyesight. From this scientific data really sound engineering can be projected.

In school lighting the same scientific approach has long been needed. It is not surprising then that when the following questions came to the Sight Conservation Council that its oculists, engineers, optometrists, and school authorities considered them the most needed beginning to the problem of school children's eyesight and seeing. The questions came from teachers, school principals, and superintendents.

Over 200 such questions were sent in. Eliminating duplications, they are condensed to a list of 130 questions below. Of these about ⅓ are questions involving the physiology of the eye. Another ⅓ involves lighting. A tenth involves posture. The remainder are border line to these three main classifications.

In extending his invitation Baker made it clear that the Sight Conservation Council would not guarantee to answer all the questions sent, but it did agree that each question the Council did answer would be the answer of an authority in its particular field.

To develop the true answers to these questions seven committees were set up; a committee on opthamology, one on child behavior in education, one on refraction, another on posture and seating. Others on illumination, on science, physics and health, and one on psychology.

The value of such questions comes from the fact that *these are the questions that teachers ask about lighting and seeing*, not what the industry or the profession thinks they should know.

To the electrical industry such questions are an index to the kind of knowledge about lighting and seeing that it should be prepared to submit to school teachers, school principals, and school boards.

The official and correct answers will be run serially in succeeding issues of ELECTRICAL WEST.

1. What is considered best posture for (a) writing (b) reading.
2. What is the relation between sitting posture and eye strain?
3. Can inattentiveness to blackboard lessons be traced to an eye difficulty?
4. Can inattentiveness in reading be traced to an eye difficulty?
5. Would the eye difficulty be the same in both cases?
6. What kind of a test chart should be used by a teacher for eye examination?
7. Does a nurse use the same kind of a chart for a more detailed examination?
8. When a youngster is seen to be squinting what does it indicate?
9. When they squint at near objects?
10. When they squint at distant objects?
11. What are the best sizes of type for different school ages in reading?
12. Do amounts of illumination have anything to do with the size of type for reading?
13. Does nearsightedness, farsightedness and astigmatism cause the same kind and degree of eye strain?
14. If one of these defects caused certain attitudes and behavior toward classroom study, would either one or both of the others be characterized by the same attitudes and behavior?
15. If glasses of full corrections compensate for defects and give normal vision, will they at the same time relieve focusing muscle strain?
16. What is the relationship of eye strain to body fatigue?
17. What is a clear explanation of eye strain?
18. Is poor alignment in writing due to an eye defect? What kind of a defect?
19. What does it indicate when pupil—
    (a) Holds a reading page close to his eyes?
    (b) Holds the page far away from his eyes?
20. If a child is wearing prescribed glasses is there any need of a Snellen Chart examination by teacher or nurse?
21. How best can you keep a youngster from memorizing a Snellen Chart?
22. What are running eyes?
23. How do running eyes retard or impair vision?
24. Does this cause body fatigue?
25. What does it indicate when a youngster is observed shutting or covering one of his eyes in reading.
26. What is meant by—testing Visual acuity?
27. How should windows be shaded for best all-round seeing of each pupil in a classroom?
28. Is the defect of astigmatism progressive?
29. What are advantages of having children's eyes examined before entering school?
30. Would such an examination suffice for all time?
31. If not, how often during early school life should the eyes be examined?
32. Should they be examined more often in the early years of school life than in the later years of school life?
33. What is meant by the statement "using Drops" in an eye examination?
34. What is the relationship between Eye Health and General Health?
35. What is indicated when it is noticed that a youngster has:
    (a) Swollen eye-lids?
    (b) Unusual redness of eyelids?
36. What is Glaucoma?
37. Can any kind of an eye examiner detect Glaucoma symptoms?
38. Is Presbyopia ever found among children of school age?
39. Is screwing up the face and squinting caused by the same kind of an eye defect? If so, is the defect greater when the face is screwed up rather than just squinting?
40. Can young eyes be injured by too much reading?
41. What does it indicate when a pupil blinks continually while reading?
42. What difficulties might a teacher look for in a child who rubs his eyes frequently?
43. Another child who doesn't exactly rub its eyes but brushes them, upon being asked why she did it replied—I am trying to brush a blur away.
44. Are both of these caused from the same thing?
45. Can glasses correct impaired or loss of vision in the case of a cataract?
46. Can eye strain produce cataracts?
47. Do congenital syphilis symptoms differ from acquired syphilis symptoms?
48. How?
49. What is the handicap, if any, of children who squint?
50. Are the eyes more at rest looking at near objects than when looking at distant objects?
51. Are the eyes ever at rest during waking hours?
52. What are the position of the eye-balls when the eyes are at complete rest?
53. Would you look for an eye defect in a youngster who stops reading frequently when there is apparently nothing of a distracting nature around him?
54. What causes eyes to cross when reading, when at all other times they appear to hold their natural position?
55. What part or parts of type letters are blurred or eliminated by an astigmatic defect?
56. Can an eye be astigmatically defective for reading and normal for distant seeing? Or vice-versa?
57. Normally how far should you hold a book away from your eyes to read easily?
58. Can inattentiveness in reading be traced to an eye difficulty?
59. Can inattentiveness to blackboard lessons be traced to an eye difficulty?
60. Would the eye difficulty be the same in both cases?
61. How long a period should a child be allowed to read continuously?

62. Should a child be seated or caused to stand during a Snellen chart examination?
63. How dependent is a Snellen Chart examination?
64. In the State of California how many professions are licensed to make eye examinations?
65. Which is the best color for blackboards—black or green?
66. Why?
67. Is it necessary ever to have blackboards artificially lighted?
68. Can tilting of blackboards help in eliminating specular reflection?
69. Is it important for young children to hold their books up from fourteen to twenty inches from the eyes?
70. If nearsightedness causes blurred vision of near objects, an individual can avoid looking at them if he wants to; Is that right?
71. If farsightedness causes blurred vision of distant objects, an individual can avoid looking at them also if he chooses; Is that right?
72. But, if the eye defect is astigmatic and vision blurred both near and far, the only thing an individual can do to avoid the blur is to close the eyes; Is that right?
73. Is the swivel chair satisfactory for school use?
74. What is the relationship of posture to general health?
75. What is considered best posture for:
    (a) Writing?
    (b) Reading?
76. Should desk tops slope for writing?
77. Does the angle at which a book is held in reading really matter?
78. Are book holders worth while for school use?
79. What is wrong when a boy or girl holds his body tense or thrusts his head forward when looking at distant objects?
80. How many parts of the eye are refractory?
81. What is meant by a refractory test only?
82. How can specular reflection be eliminated from blackboards?
83. How can specular reflection best be prevented on desk tops—
    (a) By a dull finish process
    (b) By tilting the desk top
    (c) By arrangements of desks?
84. Should seats be arranged so that they never face the light?
85. Are sun beams striking desks or blackboards harmful to the eyes?
86. What is the relation between sitting posture and eye strain?
87. Is it true that front light decreases effective illumination for those who face it?
88. Is it harmful to have the shadow of the hand or head fall on writing paper or on book?
89. What is color fatigue?
90. How much light should one have for best all round reading?
91. Is too much light, glare?
92. What is glare?
93. How may shades best be used to prevent glare on blackboards?
94. Can you give an effective non-glare formula for desk tops?
95. Is the Optholmolgraph the instrument used by Dr. Luther Gilbert of U.C. and Prof. Danner of Stanford in their work of photographing eye movements?
96. Are they catalogued anywhere?
97. Where?
98. Upon returning to the schoolroom after playing in the bright sunlight, do children's eyes adjust themselves immediately for reading?
99. What is the Metronoscope?
100. What is its purpose?
101. Can it be used successfully by teachers generally? Or does it require special training for its use?
102. What is an optholmograph?
103. Does it require an especially trained person to properly operate it?
104. If the eye in reading jumps across the page, does it also jump in following a moving object?
105. What is meant by regression in reading?
106. Is Snellen Chart distance (20 ft.) changed by the use of a mirror? Example—subject sits 5 ft. from a mirror with the chart 15 ft. from the mirror; does this constitute 20 ft. in seeing?
107. In the case of using a mirror how much more illumination is required to compensate for the reflection factor?
108. Are clouds in the sky as bright or brighter than sky brightness?
109. What is meant by foot lamberts of brightness?
110. Is too much light—Glare?
111. Is too much brightness—Glare?
112. What is the difference, if any, between light and brightness?
113. Is indirect light best for classrooms? Why?
114. Can so called direct lighting be made as effective in the classroom as indirect lighting? How?
115. What colors are best for a classroom—
    (a) For walls?
    (b) For blackboards?
    (c) For window shades?
116. What colors are best for a classroom—
    (d) For children of different ages?
117. What is the physiological explanation of reduced seeing because of glare?
118. Is there more than one kind of eye testing chart to use in testing various seeing tasks? If a Snellen chart is used how much illumination should there be on it?
119. If raw sunlight is objectionable coming through windows at the side of the room, could desired comfort effect be sustained by placing the children with their backs to the windows?
120. What type of lighting is best for vocational classes, i.e., direct, indirect or semi-indirect?
121. What are the primary colors of pigment?
122. What are the primary colors of light?
123. What is a Lumen?
124. What is a foot candle?
125. What is the range of artificial light loss to overload lighting circuits?
126. What factors determine the naming of direct lighting—indirect lighting, semi-indirect lighting, Luminous indirect lighting?
127. Is there a recognized scale of "seeing losses" due to angles of glare?
128. If so, what is it?

Model Homes

Seattle Adequate Wiring Bureau presents new houses

Not one model home, but five, will tell the message of Certified Adequate Wiring to Seattle's home buyers this fall!

Each of the distinctive "Puget Sound Houses," now completed at Sheridan Beach, scenic residential suburb on the north shore of Lake Washington, is being wired in strict accordance with specifications provided by the Seattle Adequate Wiring Bureau, according to R. D. Horning, secretary-manager of the Bureau.

Unusual interest attaches to the project because of its sponsorship, a co-operative plan supported jointly by a leading department store, a land and building company, and a bank. The Seattle Adequate Wiring Bureau has recently become a co-sponsor of the five houses, in conjunction with their initiators, the Bon Marche, Puget Mill Co. and the Seattle Trust & Savings Bank.

"These houses have been individually designed by five of our leading architects," continued Muffley. "Because of their strong sponsorship, they will attract large crowds of interested home builders and home buyers. It is an exceptional chance to prove the value of Certified Adequate Wiring in the modern home of today. We're taking full advantage of all promotion phases of the project."

A section of a recent PG and E advertisement showed this effective, simple art treatment

Trying to get light and operate a washer and iron from a light socket cheats you by causing voltage drop.

Light is dimmer and toaster slower if you do this in your kitchen. This double plug ugly is a robber.

Down goes electric pressure when a three-way plug is used. Causes lights to go dim or blink.

Avoid the make-shift of double and triple plugs in the home you are building or remodeling. Give your electrical contractor an honest chance to do a complete and adequate wiring job. Remember a low price on a wiring job like a low price on most anything is not always the best bargain.

SEE YOUR ELECTRICAL CONTRACTOR

THIRD OF A SERIES which represents a new approach for solving one phase of the "bottle-neck" problem, is the Commercial and Industrial Building Re-Wiring Market, issued by the Edison Electric Institute. This booklet sells at 35c a copy, and the set of three, including with this booklet, Basic Factors of Adequate Wiring and Covered Neutral Cable Helps Sell Adequate Home Wiring, sells at 60c.

SMALLER ELECTRICAL CONTRACTORS sometimes appear to have the idea that the demands of their business leave no time to bother over attractive window displays, but J. H. Patterson of West Vancouver, B. C. disproves this belief. His headquarters contains no appliances and are more in the nature of an office and workshop than a showroom, but this does not prevent his effective use of two display windows. Articles used every day in contracting work are tastefully arranged in the windows with a sign bearing Patterson's name and the word "Electrician."

Before— and After

Portland Public Library's reference room when illuminated with eleven 750-watt lanterns which had to light an area of 4,000 sq. ft. Authorities were fortunate in finding adequate wiring capacities when new installations were made. Many libraries have such old-fashioned lighting

The same reference room in the Portland Public Library has taken on a new mantle of light, flooding up and down from 21 new Westinghouse totally indirect luminaries, using 1000-watt lamps. Eighteen ft.-candles take care of this 45 ft. x 90 ft. room with a 30 ft. ceiling

LIGHTING in the average library throughout the nation is undoubtedly poor. Even such a splendid institution as the Central library in Portland found a need for more and better light in its large reference and technical rooms, where eyesight is important, where reading is intense.

The reference room, for instance, had a total area of 4,000 sq. ft. and up until the recent new installation, eleven 750-watt lanterns were used. These were replaced with 21 Westinghouse totally indirect luminaires, using 1000-watt lamps. And lo and behold, a transformation came over the entire room.

In this room, authorities were fortunate in regard to wiring capacities. At the time the building was erected, there was installed sufficient capacity, and an outlet box was in the ceiling at the location of each new unit.

To the lighting cabinet there was a series of No. 12 duplex wires installed to take care of the switching. The circuits were revised and also the switching. The No. 12 duplex was pulled out and a No. 12 single braid wire was installed while some of the circuits were changed to 3-wire control. The result is that it is possible to switch each light separately, direct from the cabinet.

In the technical room, which is 2,400 sq. ft. in area, the former installation consisted of four 1,000-watt lanterns. These were replaced with four 4,000-watt specially built fixtures, using oxide aluminum reflectors combined with the use of the special bi-post lamp burning base down, giving an intensity of 22 ft.-candles in every part of the room.

Again, as in the reference room, wiring facilities were excellent. Ample conduit capacity was there in which to install additional wires. This room had No. 12 duplex in conduits from the cabinet, which were removed to make way for No. 12 single braid wires, with a total of 16 circuits, four circuits to each fixture.

With this type of a unit, the lighting control is very flexible for the reason that each lamp is controlled by a separate circuit of No. 12 wire and can be switched independently.

The wiring installation was made by A. R. Johnson Co., electrical contractors, and the special fixtures were built by the Baker-Barkon Co., Portland.

Here's a "before" picture of the technical room in the Portland Public Library when lighted with four 100-watt lanterns. When this building was built architects and electrical contractors provided it with adequate wiring facilities. New 4,000-watt fixtures were easily installed

An "after" picture of the technical room also shown at the left. Oxide aluminum reflectors combined with the use of a special bi-post lamp burning face down were used, giving the 30 ft. by 80 ft. room an intensity of 22 ft.-candles in every part of room, offering readers better sight

Safety Campaign

Long Beach Junior Chamber of Commerce annexes national award

National award for the best "Safety With Light" program sponsored by the U. S. Junior Chamber of Commerce was won by Long Beach, with Denver tied for second, and San Francisco third. Junior Chambers of Commerce in 43 cities participated in the national campaign to eliminate a major portion of the increasing traffic deaths by providing adequate safety visibility through the modernization of street lighting systems.

"Fatal Street Surveys" were one of the features of the program. In these thousands of individual accident records were analyzed. In Long Beach the studies conducted by the Junior Chamber showed that excess night accidents and fatalities were costing the city a total of $9,875,000 per year, or an average of $4,880 per mile of street. Nine thoroughfares in Long Beach accounted for over 50% of the total accidents and almost 70% of the night accidents. Twice as many night accidents occurred as day accidents, despite the fact that night traffic was only one-quarter as dense.

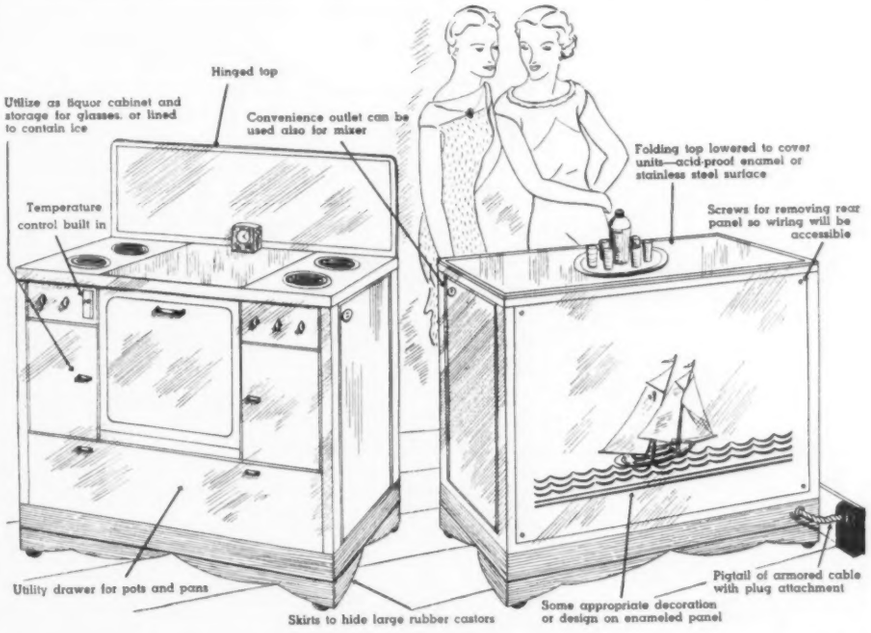
So successful has been this activity that it will be continued as an integral part of the Junior C. of C. program for the coming year, in many instances at the specific request of municipal authorities.

UNANIMOUS VOTE of the board of directors and the executive committee of the International Assn. of Chiefs of Police at their recent annual convention in San Francisco brought about the adoption of a resolution to urge all city and state police heads to reduce night highway accidents. They propose to do this by rigid enforcement of headlight and other laws affecting the use of streets and highways at night by drivers and pedestrians. Special enforcement attention will also be given to drunken drivers and pedestrians.

ONE OF THE SAFEST sections of heavily traveled highway in the world is the 8.25-mile stretch on the San Francisco-Oakland Bay Bridge according to accident statistics maintained by the California State Highway Commission. In 33 months since the bridge opening in November, 1936, the accident rate has been one per million car miles despite an average traffic rate of 25,000 cars daily. Due to the sodium vapor lighting the night accident rate is 1.26 for every daytime accident. On most highways this ratio is considerably higher.

The "Safety With Light" Committee of the Long Beach Junior Chamber of Commerce, which won the first award in the national contest sponsored by the U. S. Junior Chamber of Commerce

AFTER FOUR YEARS of revision, the Los Angeles new electrical code is about to be issued. It becomes effective 120 days after signature by Mayor Fletcher Bowron, on Aug. 24, which would be middle December. First copies are expected from the printer in October. The code as presently revised contains about 50 per cent less words than the previous edition, which was written to be legally puncture-proof but only has resulted in confusion and difficulty in interpretation. The present code revision has been made by a committee of contractors, manufacturers, utility engineers and inspectors selected by the Electrical Development League of Southern California from the associations in the industry. It contains some innovations in respect to circuiting permitted for feeders to several air heaters, and also some new concepts in appliance circuit arrangement.


Hinged top
Utilize as liquor cabinet and storage for glasses, or lined to contain ice
Convenience outlet can be used also for mixer
Folding top lowered to cover units—acid-proof enamel or stainless steel surface
Temperature control built in
Screws for removing rear panel so wiring will be accessible
Utility drawer for pots and pans
Skirts to hide large rubber castors
Some appropriate decoration or design on enameled panel
Pigtail of armored cable with plug attachment

Most parties seem to start or end in the kitchen. That's why a grand idea is to put the kitchen range on castors, finish the back in some decorative way, and convert it into a home bar or buffet table. Suggested by J. E. Schull, commercial department, Southern California Edison, this innovation should keep in step with modern entertaining, make ranges serve a dual purpose

Modern Blacksmithing

By G. H. Bliesner

BECAUSE of the increasing trend toward the use of more mechanical power on the farm, the matter of machine maintenance becomes increasingly important. As horses gave way to tractors, then disks, harrows, plows, combines, mowers and other machinery have been adapted for tractor drive. Furthermore the passing of the horse has a corollary—the passing of the community blacksmith shop. Thus a suitably equipped farm shop becomes a virtual necessity on the modern mechanized farm. Obviously such a shop should be designed to meet the requirements of the individual farm. And equally obvious is the fact that insofar as possible it should be electrically equipped throughout.

Indicative of modern farm shop design and equipment is the shop just completed on the 310-acre mechanized farm operated by Gus Krause on the lines of the Portland General Electric Co. near Hillsboro, Ore. The only farm animal on the place is a dairy cow. Grain is grown on 208 acres and walnuts on the 42 acres of additional tillable land. Included among the machines used are three tractors, plows, a combine, mower, hay rake, disks, harrows and several other deep and surface tillage tools. An electrified walnut dryer and a fanning mill for cleaning grain complete the equipment.

To maintain this equipment a modern 24x40-ft. shop has been erected with a 10-ft. open frontage for a chain hoist and trolley. The shop is shown in the accompanying photograph with details of plan and layout in the accompanying drawing. Table I shows the equipment installed. Table II lists the costs.

The wiring layout provides for 120/240-volt dual outlets for lighting and portable power equipment, each so arranged that only equipment of the proper voltage may be used in the proper outlet. A 60-amp., 240-volt entrance switch has proved adequate even for the welder. Due to the fact that the power grinder is operated from the overhead line shaft two additional pulleys are employed so that sickles will not contact the belt and injure a workman. The forge hood has been built to permit adjustment in the height; this, with good chimney construction, prevents soot from accumulating on the farm tools.

"A saving of $100 per year on the average mechanized 160-acre farm," says Mr. Krause, "is a conservative estimate where an adequate farm shop and machine shed are available. With my farm shop I am able continually to keep my machinery and tools repaired. My shop is the focal point for all farm operations since good tools are necessary for profitable farming. Often the cause of farm failure may be traced to cheap machinery, no winter shelter and the lack of necessary repairs. The shop building and the equipment in it cost approximately $2,500. However, I feel that this investment is justified on my farm since I have a $10,000 investment in farm machinery."

Plan and layout of the Krause electrically-equipped farm shop

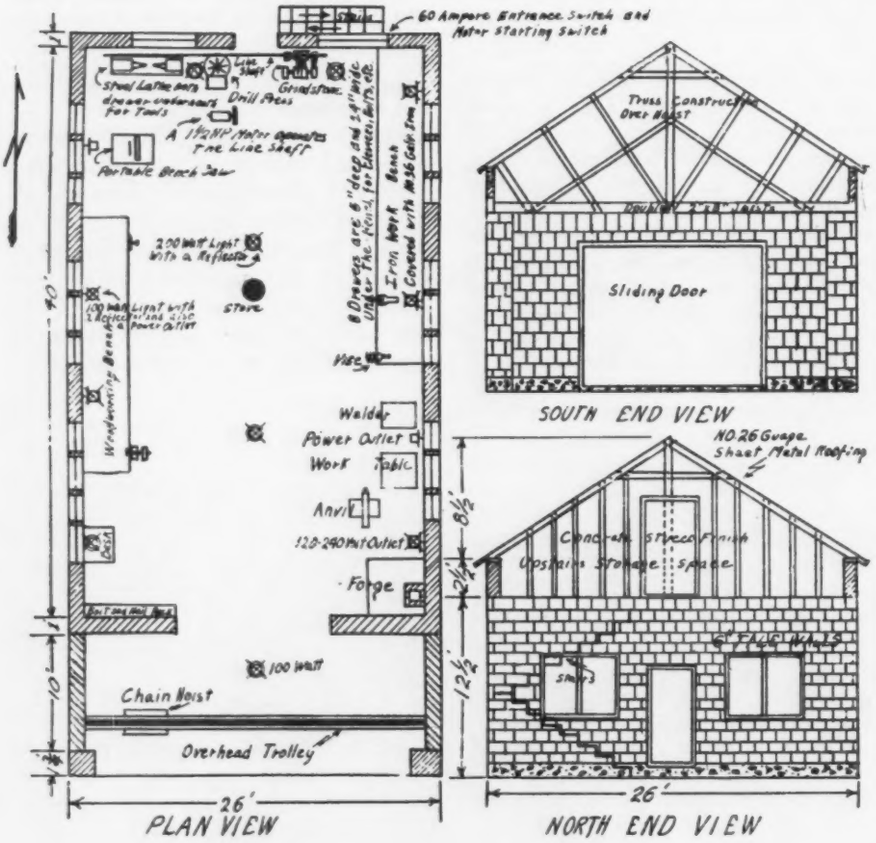


Table I—Electrically Operated Tools in Farm Shop

Equipment	Size	Speed (R.P.M)	Rating
Line shaft	1-7/16 in.	600	1.5 hp.
Drill press		600	Line shaft
Drill (portable)	½ in.	375	1/8 hp.
Forge	18 in.	1,725	1/10 hp.
Power grinder	12 in.	2,000	Line shaft
Lathe (steel)			Line shaft
Saw (bench)	10 in.	3,000	1.0 hp.
Lighting	100-200 watts		1,000 watts
Radio	5 tube		75 watts
Soldering iron	200 watts		200 watts
Welder (arc)	7.5 kva., 59% p.f., 220 volt, 35 amp primary		

Table II—Investment in Shop

Building	$1,000
Forge, anvil and tools	75
Welding set	250
Drills and press	75
Bench and drawers	35
Die set	60
Vises	50
Grinder	250
Line shaft, motor and belts	60
Bench saw	150
Lathe	75
Wood bench and tools	50
Iron stock, bolts and shelf	70
Stove and pipe	20
Wiring, switches and fixtures	75
Hoist and trolley	40
Wrenches, valve set and miscellaneous tools	75
Soldering set	15
Desk and drafting equipment	30
Total	$2,455

RURAL LOADBUILDING

Krause farm shop showing open front where chain hoist and trolley are installed. This type of shop on the modern mechanized farm takes the place of the old blacksmith shop ,and is all important in the success of a farm where modern machinery represents a real investment

A shop as elaborate and complete as that on the Krause farm may not be justified in every instance. However, some kind of a shop is essential on every mechanized farm. It can be demonstrated that the investment will soon be paid off from the savings in time and in the purchase of new farm machinery.

Heating Wax — Electrically

By C. W. Wildebour

PLUCKING of poultry by the application of hot wax is a comparatively new development that saves the poultryman time and money. With the widespread application of electric power in the poultry industry, it is only natural that electricity be adapted to the equipment necessary for heating the wax used in the plucking process. Through experimental work in the farm electrification laboratory of the Puget Sound Power & Light Co. there has been designed a combination piece of apparatus for both melting and reclaiming this poultry wax which embodies several advantages over equipment formerly available.

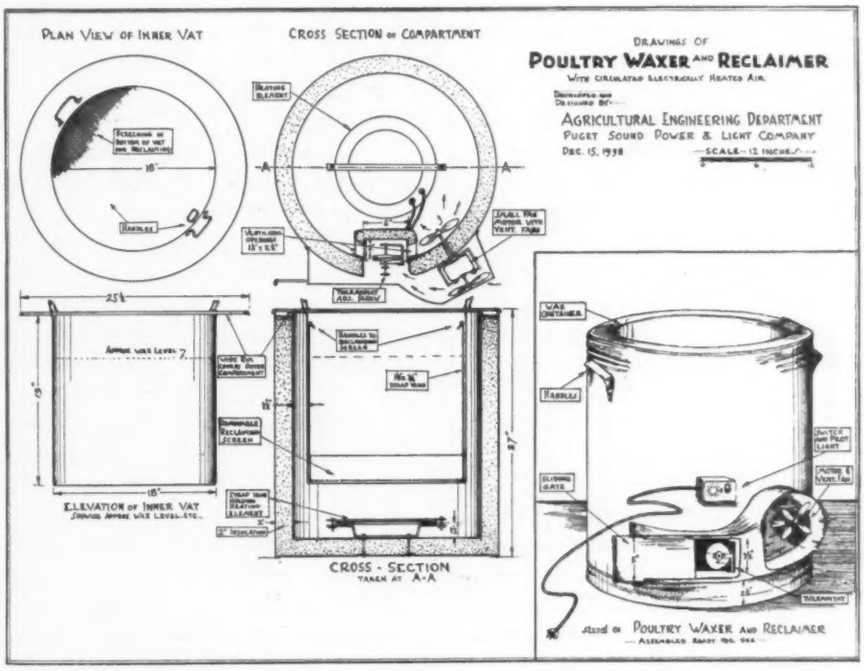
In the wax process the birds are first killed, then semi-scalded, partially ruffed and allowed to dry thoroughly. Next they are dipped in hot wax. When the wax coating is partially hardened, it is peeled off in large pliable pieces. This hardening may be done by merely hanging the bird or by dipping it in water of a temperature of 65 to 70 deg. F. The peeling of the wax removes all remaining feathers, including pin feathers, leaving the birds perfectly clean and of fine appearance.

The wax for dipping must be maintained at a temperature of 118 to 120 deg. F. Because wax is a poor conductor of heat, it is necessary to surround completely the container of the molten wax with heat. Previously this has been accomplished by water jacketing the container. Practically all commercial apparatus is of this type. However, water jacketed equipment has the disadvantage of high first cost and expensive maintenance. Provision also must be made for reclaiming the wax.

The device designed in our laboratory serves both as a waxer and a reclaimer. Its cost is considerably less than equipment now on the market. As shown in the accompanying drawing, it consists of three telescoped galvanized iron cans. The inner can holds the wax; the next provides an air space around the container and serves as the inner shell for the insulation: the final can serves as the exterior of the device and allows for 2 in. of insulation. Hot air in circulation is used instead of water jacketing. Circulation is obtained by means of two 5½-in. four-bladed fans driven by a small fan motor. Heat is supplied by a 1,000-watt Chromolox dry type ring unit. Heat regulation is accomplished by means of a wafer disc brooder thermostat. As shown in the accompanying drawing, the thermostat is placed in a small insulated compartment which has two side slides and one front slide. The inner fan provides air circulation and the outer serves the two-fold purpose of cooling the motor and blowing cold air on the thermostat when the device operates as a reclaimer.

When operating as a waxer, the two small side slides are opened and the front slide closed. The thermostat is set to maintain a wax temperature of 120 deg. For reclaiming the wax the two side slides are closed and the front slide is opened. No thermostat adjustment is necessary. The outer fan cools the thermostat discs so that they will not open until the desired temperature of 280 deg. is reached.

Circulating air-type combination poultry waxer and reclaimer designed by Puget Sound Power & Light Co. agricultural department. This new development both melts and reclaims poultry wax



ELECTRICAL WEST

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Now Watch the Women

WHETHER or not anyone likes to admit it, women exert a tremendous influence on the electrical industry. They purchase appliances and then tell their friends if they like them. They select the lighting for the home, many times with more thought to the aesthetics of interior decorations than to eyesight conservation. They pay the "light" bill out of their household budget without knowing that electricity is the biggest bargain they buy. They vote, frequently without consultation with husbands, and sometimes with more emotion than reasonableness. They are the ones who must be sold on the inadequacy of the wiring in their homes. Their sufferance, goodwill and continued support are essential for a large measure of the industry's continued progress and prosperity.

However, there is another segment of womanhood that is equally important. These are the women of the industry itself. Behind counters and information desks, they meet the public. Their courtesy and efficiency on telephone switchboards influence goodwill. The demonstrations they conduct in stores and in homes, make satisfied or dissatisfied users of appliances and electric service. In the intricate business machine they perform efficiently and well. Outside their jobs, they influence customer and public relations by voicing their opinions and spreading their knowledge of the industry in which they earn their livelihood. Their importance is oftentimes overlooked, and their possibilities for serving as a coordinated and coherent group to carry the industry's story to women in general is ignored.

Hence the recent step of the Pacific Coast Electrical Association to reinstate women's activities as a definite part of its program is a wise and opportune move. The two meetings held during last month's conclaves demonstrated that the women are anxious and ready to become active advocates in every campaign involving the welfare or progress of the industry. Given the opportunity, they will do a creditable job. And that isn't a challenge—it is a statement of fact.

A Treasure to Be Saved

A FULL month ahead of time the romantic and not-soon-to-be-forgotten Treasure Island with its Golden Gate International Exposition closed its gates and its impressive and colorful courts. The beauty of its lighting no longer rests upon the waters of a night bay as a glittering jewel on a dark silken gown. A nostalgia for the transport to another and more lovely world which a visit to the island at night permitted will long haunt those who lived with the fair from its inception.

Every visitor to Treasure Island thrilled at the lighting which at nightfall transformed buildings and gardens into a veritable fairyland. Truly it was painting with light and a new form of light as well. The illumination engineers had new pigments for their palettes, the orchid tones of fluorescent tubes. And they achieved a breathtaking color harmony that fitted mood, landscape, building, statue or fountain. Of all features of the fair, the lighting will be remembered longest. It will stand out as a new milepost on the already long record of decoration with light.

Yet the thing that is regretted being lost the most, the beauty of gardens and of lighting, is the one thing that may still be preserved. It may be carried to any city or town that has parks or gardens where the same magic of the night may be applied by electricity.

Many of a city's parks are enjoyed by a few who may visit them in daylight, but when night comes, without adequate lighting, they become a danger zone near which no woman or child dares linger. That time which more of the populace has free to enjoy its parks finds them deserted and

dangerous. And the only difference between the safety and serenity which any woman or child could enjoy at any time at Treasure Island and the dangerous park is lighting.

Perhaps the lofty architecture, with its Pacific motives and oriental influences, may be missing from the city park, but scarcely a one but has trees and gardens of age and dignity. The magic of lighting at the Fair was largely that of light playing on and filtering through trees. This magic electricity makes possible anywhere. With such magic came safety to women and children as well as restful beauty and enjoyment of the out-of-doors.

This then is the treasure that may be saved by every Western city from the magic store of Treasure Island. Now that the lights there have blacked out to make way for the white searchlight beams of an airport, the flashing beacons of its signals to aviators and the tiny marker lights outlining the field, the beauty that was of Treasure Island can be made to blossom in every park and grove and garden in the West—by electricity.

BUSINESS *Stands Against War*

Let us take a clear-eyed look at this thing we call War.

WAR is a political tool for domination or suppression; a device of futility—unless it be waged in defense of our homes, our property or our rights—in the preservation of our liberty. War destroys everything it touches. So completely does it disrupt the order and progress of civilization that humanity falters.

Dangerously widespread amongst our people today is the assumption that our participation in the European War is inevitable. Some mistrust the temper and program of the federal government as likely to lead us into it; others fear that our sympathies will make us an easy prey to the propagandists; still others suspect that business and industry, in a blind greed for profits, may involve us in the conflict.

To give credence to such beliefs is to deny that we are normal individuals, endowed with intelligence and a will, or the ability, as a people, to profit by our own experience. In all human experience, death only is inevitable.

To say that Industry and Business want war or will encourage, directly or indirectly, our participation in the present war, is a vicious and deliberate lie.

The millions of us who, since the World War twenty-five years ago, have devoted all our efforts and energies to creating and building and improving that which we know today as American Industry and Business, are convinced that the destiny of this country can be wrought only in peace. We cannot, and *must* not, stand aside and watch even the little progress we have made since that war sacrificed to the pestilence of another world conflict. We who are trying to build a lasting heritage for those who will follow us truly know that "there never was a good war or a bad peace".

Perhaps it is time to re-emphasize two of the three elements of our democratic faith, so simply stated by Abraham Lincoln, "that government of the people, by the people, for the people, shall not perish from the earth". Now, of all times, it will be wise to inform our political stewards that government by the people and for the people must be the guiding principle in what they do during the days to come, and that it is our *will* that in our country peace shall be preserved.

Only the grim and solitary courage of each of us, the determination to exert all our intelligence, all our individual influence in every way, can insure the preservation of peace for our country.

Preparedness we know to be the most effective preventive weapon against the threat of war. We must be certain, therefore, that we provide our air, land and sea forces with the best in armaments and material, in adequate supply to maintain properly and impressively our national responsibilities and defense.

Most important is that we as individuals, thus inspired, band together to exert the full strength of Industry and Business in the maintenance of peace.

If we are to succeed, we must be forceful, we must be articulate. To that purpose we pledge ourselves and the resources of our publications. An expression from our readers will greatly assist in such a mobilization of industrial opinion. Together, in this critical time, we can serve America well!

James H. McGraw Jr.

President, McGraw-Hill Publishing Company, Inc.

This message is appearing in all McGraw-Hill industrial and business publications, reaching over a million readers.

NEWS OF THE INDUSTRY

REA ADMINISTRATOR CHARGES WWP CONSTRUCTION AS SPITE

In a bitter attack on the Washington Water Power Co.'s proposed $1,000,000 rural line construction program, Harry Slattery, REA administrator, charged that the utility was trying "to smash rural electrification projects in eastern Washington." Slattery stated in a letter to members of four farmers' electric cooperatives in eastern Washington that it was a menace to the entire federal power program in the Inland Empire. The REA administrator called the WWP move a "spite" project.

Kinsey M. Robinson, president of Washington Water Power Co., immediately issued a statement to the press denying the charges.

"We have, from time to time during the last year, discussed the problem of serving more scattered areas of eastern Washington and northern Idaho with both the REA and the farm leaders of this area, and from these conversations have had every reason to believe that our new rural extension program was satisfactory and had approval of the parties concerned. Our company is furnishing power at wholesale rates to four REA projects and our relations with them have been excellent," Robinson declared.

Following these charges by Slattery, just recently appointed REA administrator, the REA has opened negotiations with WWP looking toward a possible solution of the controversy.

E. E. Royer, WWP vice-president and general manager, and M. O. Leighton, consulting engineer for the Electric Bond & Share, have held preliminary conferences with Slattery, and the REA is now awaiting a compromise from Robinson.

Among the points mentioned in the conference was the possible purchase of the company's lines by REA cooperatives in some areas, but this was not thoroughly confirmed.

THE WATER SUPPLY at Lewiston, Idaho is so pure that a new type of electric immersion water heater that uses the water as a conductor to carry the current from one pole of the heater to the other failed to operate during a recent trial. "The water is too pure," city engineer W. P. Hughes told the city council, "to carry a current and the electric cheater wouldn't work due to the lack of mineral matter in the water."

CURRENT JUMPERS

Three men leave the Los Angeles Bureau of Power & Light every morning on the lookout for jumpers. A queer task it is, but it does not mean they are hounding wearing apparel shops, nor scouting for a type of climbing vine.

Jumpers are homemade devices contrived by "gentlemen of leisure" to pass electric current around meters so that Hoover Dam energy may be enjoyed without the customary bill at the end of the month.

Some of these "jumpers" are intricate enough to make Rube Goldberg's inane inventions look like simple toys. Others consist of four ordinary clothespins and a few feet of wire.

Evidence of a jumper is easy to detect, because a consumer's bill shows a sudden unexplainable drop. Jumper detectives then watch the consumption curve, and it's almost like a photo of a jumper actually installed. Beyond convincing those "in error" the foolishness of their ways, authorities are amazed that so few of these people are killed or maimed by current on the loose.

COURT HANDS DOWN DECISION ON 1938 VALUATION CASE

Superior Judge John M. Wilson, at Olympia, Wash. recently handed down a decision in a case he heard in March, 1938, holding the State Public Service department should have included two items totaling $875,000 in the rate making valuation of the Pacific Power & Light Co.

The company, which serves the Yakima, Walla Walla area, held the items should have been included in its rate base as set up in the departmental order of January, 1937. The order had fixed the rate base and reduced electrical rates of the firm $200,000. Items which Judge Wilson held should have been included in the base were $375,000 for rural line extensions and $500,000 for expenditures in tying together the company's widespread properties.

SEDRO WOOLLEY CONTINUES FIGHT AGAINST SKAGIT PUD

The city of Sedro Woolley, Wash., continuing its fight against the Skagit Public Utility District, has filed in Superior Court an appeal to the Washington State Supreme Court from a decision handed down last September by Judge E. D. Hodge of Tacoma. The plea was filed by Charles Abbott, Sedro Woolley city attorney, who said the city "feels aggrieved at the action of Judge Hodge and does hereby appeal from each and every part of the decree."

After trial of the case, Judge Hodge ruled that the PUD commissioners were entirely within their power and rights in purchasing the property of the Peoples Water & Gas Co. Ruling on one important phase of the case, Judge Hodge declared the people had given the commissioners broad powers and that an election was not necessary to pass on bonds for the purchase of the system. The city had claimed that the district could not issue bonds without first having obtained the approval of the electorate. In a previous case concerning the purchase of a power system by the PUD, in Grays Harbor County, Judge C. W. Hall ruled that an election was necessary.

Yakima Case

The appeal for the dismissal of an action to prevent the city of Yakima, Wash., from entering into a ten-year electrical contract with the Pacific Power & Light Co., was heard by the Supreme Court at Olympia on Oct. 18. Plaintiffs total eleven corporations and three taxpayers residing in Yakima. Defendants are the city and the power company. The lower court sustained the defendants' demurrers and dismissed the action.

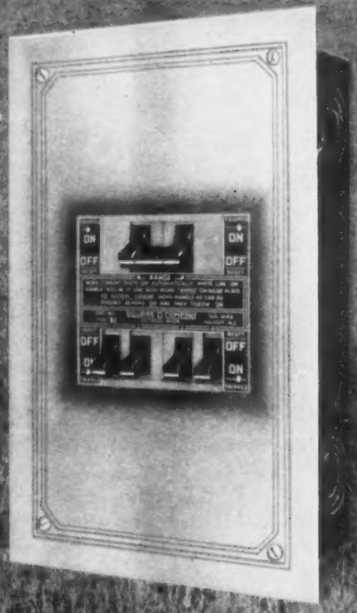
Appellants' brief said the power company's franchise with the city had expired and renewal of the franchise was defeated in an election, but that the city commissioners in June, 1938, executed a ten-year contract with the company without a vote of the people.

This action, the brief states, is to prevent the city from availing itself of cheap power through development of the Bonneville project and the public utility district. Principal question raised is whether the new contract constitutes a franchise within the meaning of the city charter.

"We are doing a lot of wiring in Rural Areas"...

Every word we quote on this page is taken from a letter written by Russell Gayton and Lester Kelsey, electrical contractors.

"When we quote, we always use the price of fuse equipment. But when we start a job we bring a Square D Multi-breakeR along and show it to the farmer. We tell him all its advantages over the old style fuse equipment and tell him we will install it for only $5.00 more . . . We have never been turned down yet!"



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Grays Harbor Power Case Set For Late November

Hearing on appeals in Grays Harbor's public power case by the State Supreme Court, originally scheduled for Oct. 20, was postponed until Nov. 20. The appeals are from a Grays Harbor Superior Court verdict outlawing the proposed purchase of the Grays Harbor Railway & Light Co. by the PUD for $2,842,000, and issuance of $3,350,000 in bonds to finance the deal. The court will set en banc for the Nov. 20 hearing, with all nine justices present, instead of the five that were to hear the appeals Oct. 20.

The executive board of the State Assn. of Public Utility Commissioners met in Seattle Oct. 21 to consider the feasibility of setting up a Central Information service for the mutual benefit of all PUDs in the State of Washington. Recently the State Grange executive committee appealed to the PUD association to take some steps toward counter-acting the present "one-sided publicity campaign against the power districts," and pledged State Grange assistance and cooperation to such a move.

PUD commissioners declare the action is favorably greeted throughout the state, asserting that the general public has made widespread demand for accurate information about the PUDs. They point out that the right of the people to own and operate their own utilities has already been settled by a majority vote in the 25 counties which have power districts.

As a result of the State Grange Executive committee's action, the State secretary will issue regular bulletins on public power for use by grange masters, and will lend help in election campaigns.

Pacific County Will Buy

Pacific County public utility district commission at South Bend, Wash., has announced that it is prepared to buy and operate the Willapa Electric Co.'s system independent of the West Coast Power Co.'s properties. The district, several months ago, signed purchase contracts for properties of both utilities under a tentative agreement with the Bonneville administration, which was to buy transmission lines of West Coast Power between South Bend, Ilwaco and Cathlamet, and Raymond and Aberdeen. Chairman R. W. Schultz of the district said, however the Bonneville Administration, although agreeing to purchase the Raymond-Aberdeen line, is vague on plans to buy the other circuits, and also doubtful as to the time it will build its own power line into Cathlamet. The district signed a contract with the Bonneville administration to buy a minimum of 1,000 kw. hrs. at the Raymond sub-station and operate the Willapa Electric system alone, awaiting negotiations for the West Coast properties. The Commission applied to the RFC for a $275,000 loan to finance its purchase of the Willapa properties and make certain extensions.

Hearing for Proposed Portland PUD Held by Hydro Commission

The hearing on the proposed public utility district for the city of Portland, Ore., was conducted by the State Hydro-Electric Commission in that city Sept. 29. The purpose of such heating was to develop facts to form the basis of a report by the Commission on the feasibility of the proposal, which report is required by law to be ready within 120 days. Sponsors of the project, called the "Bonneville-for-Portland Committee," hope to have the proposal ready for the voters at the primary election in May, 1940.

In attendance at the hearing were about 75 persons, mostly proponents. No representatives of either of the two power companies serving the city attended. They explained that they had compiled and were compiling all the facts bearing on the proposal that the Hydro-Electric Commission required, and that these facts were being presented to the Commission in written form.

State Utility Regulation

Superintendents of all municipal power and light plants in the State of Washington at a recent meeting in Seattle adopted a resolution opposing state regulation of municipal utilities. "The cities and towns of this state go on record as being opposed to being under state regulation," the resolution read in part. "The people generally in the many cities represented at the conference believe in the wisdom of having full control of their own utilities."

E. R. Hoffman, superintendent of Seattle City Light, was elected chairman of the conference membership committee and P. C. Spowart, City Light sales manager, was named chairman of the commercial committee.

Other officers named include: B. R. Lean, Cheney, acting chairman of the conference; Fred T. Hoffman, Ellensburg, chairman of accounting; H. D. Walker, Cheney, legislative chairman, and R. N. Nightingale, Tacoma, chairman of the technical committee.

$4,500,000 Budget Adopted By Grays Harbor PUD

A final budget of more than $4,500,000 for 1940, mostly contingent on its successful appeal of a case pending before the Washington state Supreme Court, was adopted unanimously Oct. 2 by the Grays Harbor Public Utility District. The contingent phases of the budget, were approved without change from the figures set up in the tentative budget prepared Sept. 5. The budget calls for total expenditures of $4,258,478 "in the event of acquisition of the Grays Harbor Railway & Light Co. as now contemplated." Estimated revenues listed as "sale of revenue bonds" and "receipts from sale of electricity to consumer" add up to the same total.

Also budgeted was $150,000 in the event the PUD cannot acquire the light company by negotiations and resorts to condemnation. A final item of "between a minimum value and a maximum value" of the Puget Sound Power & Light holdings on Grays Harbor was budgeted at from $350,000 to $500,000 bringing contemplated expenditures to more than $4,500,000.

Only four citizens, it was stated, heard reading of the budget and the resolution for final adoption. The commissioners are C. B. Sherwood, Oliver Morris and H. E. Bailey.

Puget Sound Condemnation

A major obstacle to PUD acquisition of Puget Sound Power & Light Company properties in the Puget Sound area, has been removed by the Power company, according to Jack R. Cluck, attorney for several PUD districts which have started condemnation proceedings against Puget Sound Power. For the past year, the company has refused to allow the districts to examine books and records. On Sept. 15, the State Department of Public Service held a hearing on the complaint of the districts, which had asked that the company be compelled to file wholesale rates and permit districts to examine its books and records. Before the State Department had ruled on the complaint, the company tacitly conceded the latter point, by announcing its books and records were available for PUD inspection. As a result, an accounting office is being set up in Seattle with W. S. McCrea in charge.

BELLINGHAM, (WASH.) city council, has voted to remove all telephone and power poles on streets bordering the new City Hall site, placing the wires underground.

Coast Counties New Rates To Save Consumers $80,000

Effective Oct. 15, throughout the Coast Counties Gas & Electric Co.'s system were rate reductions which will save electric customers $80,00 a year. Principally affected are domestic and commercial customers both within and outside of incorporated areas. After a 50c service charge, domestic customers in such towns as Santa Cruz, Watsonville, Gilroy, San Juan, will pay 4c for the first 35 kw.-hr., then 65 at 3.1c, 100 at 2c, 300 at 1.25c, excess at 1c.

In unincorporated areas, the service charge is 70c, the first two blocks 4.4c and 3.2 c. with remaining blocks the same.

Service charges and the first two blocks in the corresponding commercial schedules are the same, after which the rate drops off to 2c per kw.-hr. in excess of 5,000 per month. Contemplated next year is a change in the commercial schedules to accommodate a combined lighting and power rate, not now available.

Cascade Locks Reductions

Rate reductions from 21½% to 44% are planned by Cascade Locks, first city in the Pacific Northwest to buy and use Bonneville power, it was revealed in a tentative schedule drawn by the power committee for domestic users.

The schedule is as follows: first 40 kw.-hrs. 5½c; next 50 kw.-hrs. 3c; next 100 kw.-hrs. 2c; excess, 8 mills. The present schedule runs 7c for the first 40 kw.-hrs.; 3c for the next 260 and 2c to excess.

Bisbee, Ariz. Cuts

Voluntary reduction of electric rates by the Arizona Edison Co. at Bisbee that will result in a savings of $10,368 for customers in the community were announced by W. M. Cox, chairman of the Arizona Corporation Commission.

Cox said that residential consumers would save $6,026; commercial light consumers, $3,660, and commercial power consumers, $682.

The new residential rates: 6¾c per kw.-hr. for the first 30 kw.-hrs.; 5½c for the next 50; 3c for the next 100 and 2c for all over 180 kw.-hrs.

Douglas, Ariz. Acts

The Arizona Corporation Commission last month gave approval of new electric rates for Douglas, Ariz. that will save consumers there $13,526 anually, according to estimates of the Arizona Edison Co.

The new rates, which became effective Oct. 5, will save residential users $7,614; commercial users, including the municipality, $3,675; and commercial power users, $2,237.

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Ask for This Catalog

If you don't have Catalog No. 31-E and are interested in bending conduit or pipe, installing pipe underground, pulling cable into conduit, or doing any operation suggested by the list of tools shown here, ask for a copy now. If also interested in our line of hand tools for working wood—auger bits, car bits, ship augers, chisels, gouges, draw knives, etc.—ask for Catalogue No. 31. It includes all such tools in addition to those in Catalog No. 31-E.

GREENLEE TOOL CO., 1703 Columbia Ave., Rockford, Ill.

First Contract for Bonneville Power Signed; Other News

Paul J. Raver, Bonneville administrator, announced early in October the signing of the first contract for the sale of Bonneville power to a public utility district, Pacific County in southwestern Washington. The contract called for the district taking an initial block of 1500 kw. or primary power for distribution in its 895 sq.mi. area, which is now served by Willapa Electric Co. and West Coast Power Co.

The deal contemplates that the PUD will use the distribution systems of these two companies, which they will acquire by purchase from the proceeds of a revenue bond issue of $275,000. No arrangements have been completed for the sale of these bonds.

Also in the deal is the agreement by the Bonneville project to buy the high tension line of the Willapa Electric Co., between Raymond and Cosmopolis, and West Coast Power Co.'s transmission line from Westport, Ore. to Raymond, Wash. to add to its transmission network.

The rate at which the district will take power from Bonneville is the new demand plus energy charge rate recently approved by the FPC, calling for a charge of 75c per month per kw. of contract demand plus 2.5 mills per kw.-hr. In the contract the district agrees to re-sell this power at the standard retail rates to be fixed by the Bonneville project. These rates, now under preparation, are not yet disclosed.

Bids for New Line

Bonneville has followed up its new power contract with Pacific County PUD by opening bids for the construction of a 110,000 volt wood pole transmission line across Lewis and Pacific Counties, to Raymond.

The 46-mile circuit, when complete, will tie into the 220,000 volt Bonneville-Puget Sound-Grand Coulee system in the vicinity of Chehalis and terminate at the Raymond substation where Pacific County will connect its distribution system. Also from Raymond Bonneville power will be sent to Cosmopolis, on the outskirts of Aberdeen, over an existing high tension line which Bonneville is purchasing from the Willapa Electric Co. and adopting for the transmission of higher voltages.

Bids today on the new line ranged from the $55,136 offer of the Electric Contracting Co. of Seattle, to the $69,396 bid by H. H. Walker, Inc. of Los Angeles.

Nearly 1000 cedar poles, set in pairs, will be required to carry the 138 miles of conductor cable used in the line. The entire circuit will cross only two counties—Lewis and Pacific—and will pass near the communities of Pe Ell, Curtis, McCormick, Walville, Pluvius, Lehom, and Frances. Erection will begin within 10 days of notice of the contractor's award and is to be completed about four months thereafter. It will be the seventh major line construction contract awarded by Bonneville this year.

Cowling Appointed

Appointment of Edward W. Cowling, Jr. as acting chief of the land division of the Bonneville project today was announced by administrator Paul J. Raver. Cowling will assume his duties at once.

He has been loaned to the Bonneville project by the Tennessee Valley Authority, where he has been assistant director of land acquisition for the past three years. He started with the Authority five and a half years ago as chief land buyer, and supervised property acquisition for the various dams and transmission lines in that region.

Prior to joining the Tennessee Valley Authority, Cowling was in the legal department of the American Telephone & Telegraph Co., working in the New England states as supervising right of way agent for four years. Previously he was assistant head of the land department of the Florida Power & Light Co.

Sherwood Jones of the Bonneville staff will continue with the land division in a consulting capacity.

Sickler New Rate Head

D. J. Sickler, formerly chief statistician of the Wisconsin Public Service Commission, has been appointed head of the rate division of the Bonneville administration.

Sickler is a native of Washington, having studied business administration and utility economies at Washington State College and the University of Washington. He also did special work on utility rates and economics at Northwestern University and the University of Wisconsin prior to going with the Wisconsin Commission.

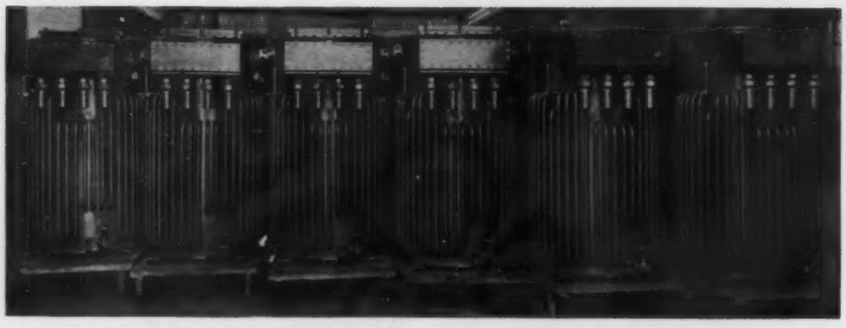
Other appointments to the Bonneville staff include three new staff engineers in the market development section, Raymond M. Miller, William C. McIndoe and John P. Durr.

Banks Returns

Frank A. Banks, former acting Bonneville Dam administrator, has returned to Grand Coulee Dam to resume his post as chief engineer for the Reclamation Service.

Approved!!

NAVY DEPOT Installs Performance-Tested Transformers



Six 200-kva, 2400/4160 Y-120/240 volt transformers installed in the Navy Supply Depot at San Diego—May, 1939

These Gardner Transformers are now in use at the San Diego Naval Supply Depot. To meet both governmental and business requirements, our transformers are sturdily built for continuous service. Our power units are engineered to satisfy the most exacting specifications—built to your order.

Write us today. Our thirty years of experience in the construction of transformers will help you solve your voltage problem.

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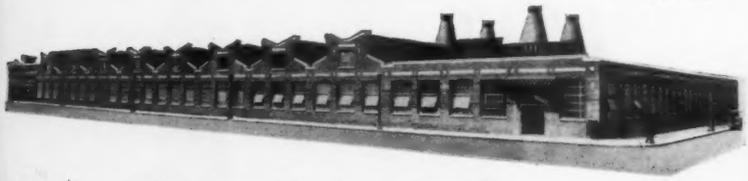
For years engineers have sought to eliminate radio interference. But it remained for Westinghouse Research and Engineering to develop, patent and produce a special metallic oxide glaze — part of the insulator itself. This glaze permanently eliminates radio interference or distressing corona at the insulator. It is guaranteed effective at or above normal operating voltages.

This new process is simplicity itself. There are no added gadgets to create extra strain on the porcelain. Instead a special metallic glaze is matured during firing over the proper areas. This glaze is part of the insulator itself, and provides a high-resistance, conducting path for the charging current. This construction in no way changes the fundamental design of the insulator and has proved completely effective in thousands of installations from coast to coast.

Costs No More

Best of all, Westinghouse R-I-P Porcelain, with all of its inherent advantages, costs no more than ordinary porcelain. You pay no penalty to eliminate radio interference and distressing corona from your insulators . . . and you eliminate customer complaints from this source whenever you replace with R-I-P Insulators. Stocked in a nationwide network of supply depots, and made in two Porcelain plants — Emeryville, Cal., and Derry, Pa. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

J-05046



This Westinghouse porcelain plant at Emeryville, Calif., is the only porcelain plant on the West Coast. It makes all sizes of electrical porcelain for this area.

Westinghouse Porcelain

W WESTINGHOUSE ELECTRIC

Visalia, Calif. Votes New Edison Franchise

Visalia city council last month, by a vote of 3 to 1, adopted an ordinance giving the Southern California Edison Co. a 50-year franchise for the distribution of electricity for heat and power in the city.

Under its terms, the company will pay the city annually 2% of its gross receipts from electricity for heat and power, but if in any year ½ of 1% of the gross receipts from all electricity sold exceeds the former figure, the larger amount will be paid.

Washington Professor Presents Proposed Power Schedules

According to Professor Carl Magnussen of the Univ. of Washington, a proper residential schedule for Grand Coulee and Bonneville power would double the annual customer consumption in the state. Power markets for the two dams must be immediately developed to consume the wealth of power that will be available in 1942, Magnussen said.

He suggested the following two rate structures as means of probably increasing demand for electrical energy by 520,000,000 kva. per year, thereby requiring an increase of 150,000 kva. in installed generating capacity.

Classifications — Block 1 (lighting, radio, irons, washing machines, other appliances,) 4.5c for 50 kw.-hr. use; Block 2 (electric ranges and refrigerators) 1.5c for 150 kw.-hrs.; Block 3, (residential heating,) 0.4c for 2,000 kw.-hrs.; and above, 1c for 2,400 kw.-hrs. with a minimum charge of 75c.

Nev-Calif. Corp. Awarded Safety Council Trophy

First place trophy for accident-free vehicle operation was awarded to Nevada-California Electric Corp. for the second time in four years by the National Safety Council last month. This year's award in the national fleet safety contest was for the public utilities truck division, while the other award to Nevada-California was in 1935 for the passenger car division.

In 1,188,000 miles operation, the utility's fleet showed an amazing record with only eight accidents, thus achieving a frequency of 0.67 per 100,000 mi. Average for the group was 2.55. J. S. Allan is safety supervisor for the corporation, whose headquarters are at Riverside, Calif.

Ogden Voters to Pass On $3,500,000 Bond Issue

For the third time in two years, Ogden voters will be called upon to to vote on the question of a municipal light and power plant as a result of action taken early last month by the city commission in passing an ordinance involving a $3,500,000 revenue bond issue.

The move, not based on federal aid, will place the question on the ballot at the regular election, Nov. 7. It proposes that if the bond issue is approved, the city commission be given full authority to work out costs and type of power plant without further referring the matter to the voters.

The proposed ordinance provides for the purchase of the existing private power system if possible, and for the construction of a steam generating plant of three units with a total capacity of 13,000 kilowatts, together with an underground electric distribution system and street lighting unit.

PG and E Day at Fair A Real Day's Outing

Probably one-third or more of the 125,000 people who were attracted to the Golden Gate International Exposition Oct. 22 were employees of Pacific Gas and Electric Co. As guests of the utility, they were on hand with their families to celebrate on one of the closing days of the Fair.

In a day filled with much to do and see, PG and E staged a radio broadcast "Tales of California" in the California auditorium, unfolding before the eyes of spectators the story of gas and electricity in the Bay area.

Two trips to Hawaii and return, a first prize in the James B. Black sweepstakes, were won by C. G. Ingersoll, of the PG and E East Bay service department.

The day of frolic and good fun was concluded by a dance and floor show held for PG and E employees in the California Building ballroom. Harry Carroll was chairman of arrangements.

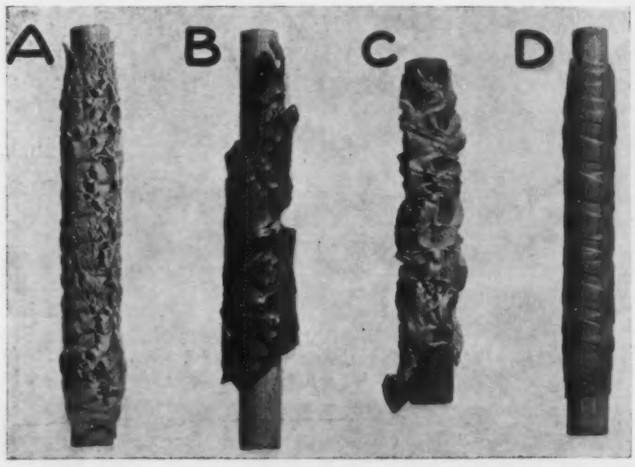
TURBINES of the Kerr hydroelectric proect on Flathead River in Montana went into full operation last month for the first time since the dam was completed more than a year ago. The Montana Power Co.'s 77,000 h.p. plant went into full production and is now operating on a 24-hour a day and seven-day a week basis. While this present program is only temporary, reports are that the schedule may become permanent.

CLIFKRONE *—the best ozone-resistant splicing compound available.*

■ The unretouched photograph below shows result of tests in laboratory of one of the largest utilities. Sample A—regular ASTM splice—failed in 18 min. in .01% of Ozone. Sample B—competing "ozone-resistant compound"—failed in 4 min. in .01% Ozone. Sample C—another competing "ozone-resistant compound"—failed in 20 min. in .4% Ozone. Sample D is CLIFKRONE, after 180 min. in .01% Ozone, and subsequent 90 min. in .4% Ozone.

CLIFKRONE withstands 40 times stronger Ozone than specification. That proves its superiority.

here's proof



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Check these Points to See— Extra Values in KEARNEY

TRIPOMATIC CUTOUTS

THERE'S really no secret as to why operating men are finding that they get fewer cartridge burn-outs, more dependable protection and greater continuity of service when they specify Kearney Tripomatics. The successful operation of these cutouts is simply a matter of proper materials, skillful workmanship and careful engineering design—

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SWIVEL HANGER—all round, clamp-type —strengthens the crossarm. Swivel joint permits facing box toward lineman. Hanger bolted to porcelain.

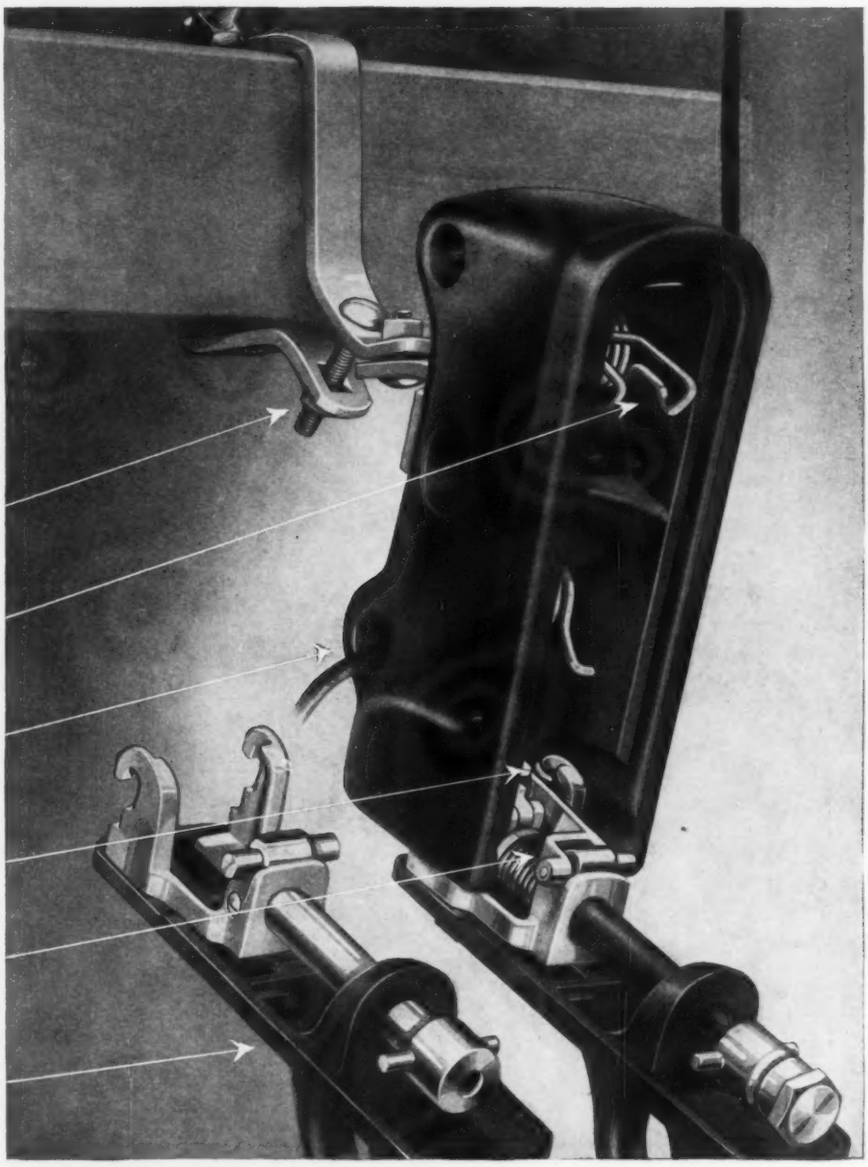
UPPER CONTACT — Kearney Point Pressure Type, is combined with latch.

LEAD CONNECTIONS — made by clamp-type terminals set in apertures at the back of the box and separated from the cartridge chamber proper.

DEAD HINGE—Illustration shows clearance from lower contact. Door is provided with large pull ring.

LOWER FUSE TERMINAL—pressure type contact which eliminates use of wing screws.

DISCONNECT DOOR—Provided with copper blade — Interchangeable with fuse cartridge door assembly.



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RFC Loans to be Sought By Washington PUDS

Loans from the Reconstruction Finance Corp. will be asked by Public Utility Districts in the State of Washington in acquiring property of private companies, according to action taken by directors of the Washington Public Utility Commissioners Association at a meeting held in Seattle, Oct. 21.

Other action taken by the commissioners included (1) recommendation by the board that each of the 25 districts in the state enter into agreements with organized labor to assure maintenance of fair wage standards when electrical properties are acquired and operation begins.

(2) Establishment of a centralized information service for all public utility districts, the board appointing C. B. Francis and Ray Hendricks, to have charge of the service.

A request was dispatched to Dr. Paul Raver, Bonneville administrator, now in Washington, D. C., to appeal to the RFC to make loans on utility revenue bonds which would enable the PUDS to acquire private companies.

OFFICIALS of the cities in Whatcom, Skagit, San Juan, Snohomish and Island Counties, meeting at Mt. Vernon, Wash., passed a resolution recently asking the State Legislature to deprive the PUD districts of the power of taking over any city utility, whether privately or municipally owned without a vote of the people.

British Power System Lauded by McLaughlin

Suggestion of the possible adaption of the British grid power system to the power set up in Washington state, was made by Frank McLaughlin, who recently returned from a visit to England. He said that the grid system is a tieup of privately owned and publicly owned systems operating under and supervised by the British central electricity board.

The following advantages were stated by McLaughlin—(1) The grid system is run on sound economic principles for maximum public benefit. Public enterprises are appraised on merits of their performance and maintain their place in the scheme of things on that basis—they stand on their own feet and are not subsidized; (2) The central electricity board's policies, principles and practices are to be fair alike to private and municipal plants, (3) there is no condemnation of private property by public government agencies. Any private company distributing power in a given area by grant of parliament has exclusive rights to serve that area. That is true also of municipal plants.

Seattle City Light Adopts Resolution for PWA Fund

Granting a request by superintendent E. R. Hoffman, approval by the Board of Public Works, the Seattle City Council has adopted a resolution authorizing an application to the Federal Public Works Administration for an additional 45% grant in aid of City Light's Ross Dam project at the Skagit.

It is explained that by an expenditure of $230,000 additional funds already provided, the dam can be built 30 ft. higher than was specified in the contract to the General-Shea-Columbia Co., which is building the dam. Of the additional $230,000 required, the PWA, it is hoped, will agree to furnish 45% and the rest will be provided by City Light.

ACCEPTANCE of the offer of the City employees' retirement system of Seattle to buy $1,000,000 of City Light bonds, has been recommended by the City Council utilities committee. The retirement system offered to buy the bonds at par, and a coupon interest rate of 4¼%. The bonds are to be in two issues, of $724,000 and $276,000 and will finance extensions of the Lighting Department's facilities to new customers.

SEATTLE City Light last month passed an important milestone in its growth, the long-sought total of 100,000 customer meters on its lines. A promotion drive during the last few months, marked by strong gains in electric power consumption, new customers and expansion of home electrification, brought the department past its objective many months ahead of schedule, Eugene R. Hoffman, superintendent of City Light, said.

SINCE THE OUTBREAK of the war in Europe, the East Kootenay (B.C.) Power & Light Co. Ltd., has closed its plants to visitors and the public. In the past these have always been open for inspection. All roads giving direct access to the company's property have also been closed and are being patrolled, while guards are on 24 hour duty at the plant.

Wagner 15 kva., 2400 to 120/240 volt, 60 cycle, single-phase, type HEB stud-bushing-type transformer. It has coordinated bushings and insulation and is self-protecting against lightning, and, therefore, inherently a surge protected transformer.

Wagner
DISTRIBUTION
TRANSFORMERS

STUD BUSHING TYPE—With bushings through tank wall.

STUD BUSHING TYPE—High voltage bushings through cover, low voltage bushing through tank wall.

POCKET LEAD TYPE—

RURAL LINE—High voltage bushing through cover, low voltage bushing through tank wall.

SURGE-PROTECTED — Stud-type equipped with arrester or gaps.

Wagner distribution transformers are modern in design and construction, and conform to the latest standards. They embody such features as: (1) carefully selected, pre-tested materials, (2) low electrical losses, (3) good regulation, (4) adequate safety features, and (5) details that make them easy to install and maintain. They are completely described and illustrated in Bulletin No. 180, a copy of which will be sent you upon request. Write today for your copy. T39-3

Specify Wagner Transformers in Your Request

Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, Mo., U.S.A.
TRANSFORMERS MOTORS FANS BRAKES

HOW'D YOU LIKE TO PACIFY A THREE-STORY GIANT?

Operators of Turbo-Electric Generating Sets Will Understand What Shell Was Up Against

Down at the West Virginia Pulp and Paper Manufacturing Company's plant in North Charleston, S. C., there's a giant Fourdrinier Kraft Liner Board Machine.

This giant machine—as high as a three-story house and as long as a city block—has one section which contains more than 1000 bearings. As in turbo-electric generating sets, all the different bearings are lubricated by oil applied through a pressure circulating system.

These people also faced the moisture separation problem so common in steam turbine lubrication.

Since this machine was installed—in May, 1937—a Shell lubricant has been used to protect these bearings. In two years' time not a bearing has been lost—not a shutdown has been necessary. And the West Virginia Pulp and Paper Co. has found that a minimum amount of make-up oil was needed. This has saved both time and money.

Whether your problems concern 1000 bearings or 1 . . . a steam turbine or a complete hydro-electric plant . . . Shell stands ready with the proper lubricant for every electric generating and distribution operation. Call local Shell office today. Or write Industrial Lubricants Division, Shell Building, San Francisco.

SHELL

INDUSTRIAL LUBRICANTS

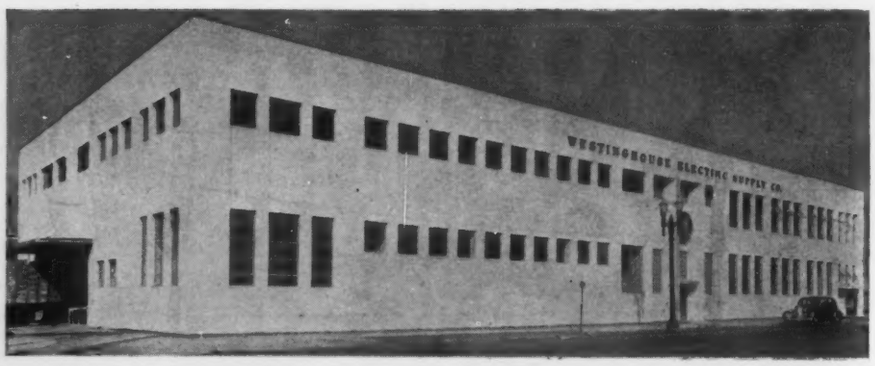
Figure the possible SAVING

You'll find it pays to use·· Tips Tap Clamps

Consider the revenue lost when service must be interrupted to make cold taps. Consider the extra time required to clear the line and erect grounding equipment, and compare this with the cost of doing the job hot with Tips Tap Clamps and Tips Grip-All Clamp Stick. Consider, too, the possibilities of repeating this performance, and you'll find it pays to use Tips Tap Clamps made in a complete range of sizes and types for all jobs.

WRITE FOR DETAILED BULLETIN NO. 1500T

A·B·CHANCE CO. CENTRALIA MISSOURI



The handsome new building of the Westinghouse Electric Supply Co. at Seattle was recently opened with model electrical installations featured throughout. Beside general offices, this 200 ft. x 100 ft. structure has display floor and warehouse, giving 40,000 sq. ft. of floor space

Contracts Awarded

To Electrical Contracting Co., Seattle for construction of a wood-pole transmission line between Chehalis and Raymond, Wash., $55,136.

To Inland Constr. Co., Omaha, for construction of 196 mi. of line for Rural Electric Co., Pine Bluff, Wyo., $143,041.

To Franzen Bros., Palisades, Minn., for construction of 151 mi. of line for Garfield County, Wash., and 160 mi. of line, north and south of Pullman, Wash. in Spokane County, $106,059, and $121,370.

To General Electric Co., Schenectady, N. Y., for 2 3-phase generators for Fort Peck power plant, Montana, $543,800.

To Pacific Gas and Electric Co., for installing night lighting system in Funston and Rolph playgrounds, San Francisco, $27,500 and $12,500.

To Hume & Rumble, Vancouver, for construction of power line for Esquimalt, B. C., dept. national defens.e

To Hume & Rumble, Vancouver, for electrical installation in new Chilliwack, B. C. hospital, $7,973.

To Hume & Rumble, Vancouver, for electrical installation in new land hangar at the Patricia Bay station being established at Victoria for Royal Canadian Air Force.

To H. G. Johnson, Portland, for construction of 160 mi. of line for Spokane County Rural Electrification, Inc., $120,306.

To S. Morgan Smith, York, Pa. for hydraulic turbines for Parker Dam project, $749,000.

To Allis-Chalmers Mfg. Co., Los Angeles, for furnishing and installing a generator in City Hall, Burbank, Calif., $253,400.

To Paul Webb, Boulder City, for construction of a new headquarters building for the Los Angeles Bureau of Power & Light, $82,000.

To H. J. Langdon, Victoria, B. C., for wiring and other electrical work in the nine magazines now under construction for the department of National Defense at Esquimalt, B. C., $125,000.

To Aluminum Co. of America, Pittsburgh, for conductor cable and line hardware for transmission line from Kelso to Renton, $424,586.

REA Activities

Benton-Lincoln Electric Cooperative, Inc., Corvallis, Ore., has been awarded $55,000 to build about 42 mi. of line, and $15,000 for wiring.

Sanders Electric Cooperative, Inc., Trout Creek, Mont., has been allotted $29.000 to build about 10 mi. of line in Sanders County.

Morgan County Rural Electric Assn., Fort Morgan, Colo., has been awarded $25,000 to build about 18 mi. of transmission lines to connect the U. S. Bureau of Reclamation.

Delta-Montrose Rural Power Lines Assn., Delta, Colo., has been awarded $50,000 to acquire 24 mi. of line and to complete construction on original section.

San Miguel Power Assn., Inc., Norwood, Colo., has been allotted $30,000 to complete their project and to defray certain expenses connected with the initial operations of the project which cannot be covered by the construction loan.

Larimer, Colo. Cooperative (now being formed) has been awarded $230,000 to build about 219 mi. of line in Weld and Larimer Counties.

Raft River Rural Electric Cooperative. Inc., Malta, Idaho, has been awarded $111,000 to build about 97 mi. of line in Cassia and Box Elder Counties.

Stevens County Electric Cooperative, Inc. Colville, Wash., has been awarded $326,000 to build about 292 mi. of line in Stevens County.

Pend Oreille Electric Cooperative.. Inc., Newport, Wash., has been allotted $194,000 to build about 179 mi. of line in Pend Oreille and Spokane Counties, Wash., and Bonner County, Idaho.

Yellowstone Valley Elec. Cooperative. Inc., Huntley, Mont., has been awarded $74,500 to build about 58 mi. of line in Yellowstone County.

Union Rural Electric Assn., Inc., has been awarded $5,000 for wiring.

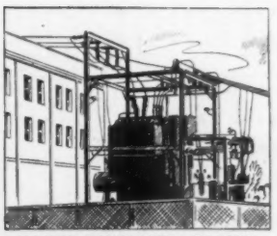
A *Star Performer* IN THE BIG TIME CIRCUIT

AMARINE non-leaded Network Cable for low voltage Secondary Networks

AMARINE network cables are simple in construction but outstanding in performance. The ability of non-leaded, rubber insulated cables to serve in secondary network systems has been proved in cities all over the country, with AMARINE network cables showing excellent results wherever they are used.

It is easy to see why the trend toward braid covered cables is growing. These cables are lighter in weight, more flexible, simpler to install; their rubber insulation is a positive protection against the effects of moisture even when the outer covering is damaged; and faults are more easily cleared when there is no lead sheath to help maintain the arc and to fuse cables together in the duct.

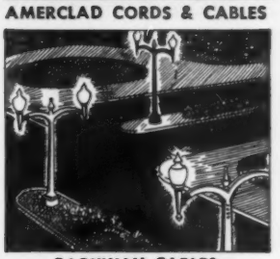
All of these advantages are embodied in AMARINE non-leaded network cables. For full information call on your American Steel and Wire Company representative, or we will be glad to send details upon request.



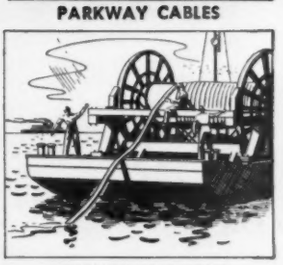
PAPER INSULATED CABLES

VARNISHED CAMBRIC CABLES

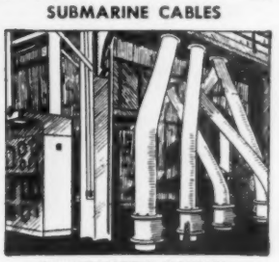
AMERCLAD CORDS & CABLES



PARKWAY CABLES

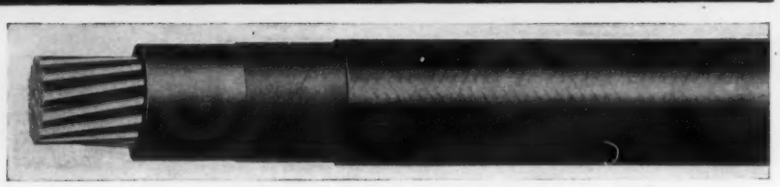


SUBMARINE CABLES



AMERBESTOS CABLES

ADEQUATE WIRING SERVES AND SAVES



COLUMBIA STEEL COMPANY, *San Francisco, Pacific Coast Distributors of Electrical Cords & Cables*

Manufactured by

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

TRADE NOTES

PCEB Fall Activities Cover Variety of Helpful Programs

Pacific Coast Electrical Bureau activities since the beginning of fall have been numerous and promise real results. Fall and winter classroom work has begun, in which courses varying from three to six lessons each are now being given to an electrical contractor's association, to Local No. 6, International Brotherhood Electrical Workers, San Francisco, and to many other trades and asscoiations. The latter class numbers more than 250 students.

Arrangements have also been made for classes for Local No. 595, International Brotherhood Electrical Workers, Oakland for International Brotherhood Electrical Workers.

San Jose, and for the Cabinet Manufacturers' Institute. This group comprises concerns doing store re-modeling, store fronts and fixture work.

In all of these courses, better lighting and the need for adequate wiring are stressed. Total attendance at these classes has reached 721, and is steadily increasing. Journeymen electricians have expressed their appreciation and have claimed that their jobs mean more to them since attending these classes.

Beyond schools, modernization work goes on. Eleven re-wiring jobs totalling $252,500 are now under way. While not all of these jobs were initiated by the Bureau, nevertheless it had some part in all of them.

Excellent prospects for about $200,000 more of immediate electrical modernization are being worked on as well as more remote prospects to the extent of a much higher figure.

The work of organizing Outdoor Christmas Lighting Campaigns is progressing. The San Francisco *Examiner* and Oakland *Post-Enquirer* have agreed to sponsor campaigns in their communities.

The Sight Conservation Council continues to work closely with the educational authorities that there may be better lighting in schools. Addresses have been made before the California School Trustees' Assn. convention, the Monterey Kiwanis Club, the teachers of Monterey County and San Benito County, and the California School Superintendents' Assn.

THE BOARD OF GOVERNORS of the Western Furniture Exchange and Merchandise Mart, San Francisco, has selected the week of Feb. 5-10, 1940, in which to hold the Western Spring Market. As this provides a lapse of two weeks between the close of the Chicago Furniture Markets and the opening of the San Francisco Market, it allows ample time for the shipment to the Coast of new merchandise samples from the East, and for the return of Western representatives who are obliged to go East in January.

MCLENNAN MCFEELY & PRIOR LTD. dealers of Vancouver, Victoria and New Westminster B.C., have just opened their new $80,000 branch building at New Westminster. The new structure, of modernistic design, will accommodate both the retail store and the wholesale business of the firm.

THE PACIFIC APPLIANCE CO. has purchased the business of the Allied Appliance Co. (the Maytag Shop) in San Francisco, and will handle that company's lines in their present store, according to W. Heyman, proprietor.

W. W. KIRK has moved his San Francisco office to 1063 Howard st., where F. M. Nicholas and E. B. Cook will be in charge. This organization represents the Delta-Star Electric Co., Standard Transformer Co., Ralco Mfg. Co., Portable Light Co. and Industrial Jewel Co., Inc.

PITTSBURGH ELECTRIC CO., Reno, has moved from 124 West Second st. to a new location at 655 So. Virginia st.

SHEIDLER'S HOME ELECTRICAL SHOP, Seattle, has moved from 4736 University Way, to 6214 60th N.E., Seattle.

WHITEHEAD METAL PRODUCTS CO. has moved its sales office and display from 3151 Wilshire Blvd., Los Angeles, to 3507 West Sixth st. The factory remains at 4801 East 50th st., Vernon.

ABOUT PEOPLE

HERB KAUB of Denver, has been appointed a representative for the Paine Co., Chicago, well-known manufacturers of anchors, and electrical and building specialties. He will cover Colorado, Montana, Wyoming and New Mexico.

ARTHUR J. MULLEN, member of the Los Angeles Board of Water & Power Commissioners, retired Oct. 12. Mullen is a former president of the board and has been a member since 1933. A resolution commending him for outstanding service was adopted by the board upon his retirement. James B. Agnew was appointed by Mayor Fletcher Bowron to the vacancy on the board.

J. STUART ROSEMOND has been placed in charge of traffic appliance and radio sales for the General Electric Supply Corp. in the Los Angeles district. At one time connected with the Los Angeles Gas & Electric Corp., Rosemond has been a member of the G-E Supply sales staff in recent years.

ROBERT F. MCDONALD, sales manager of the Westinghouse Electric Supply Corp. in the San Francisco district, has been elected president of the Kiwanis Club of that city for the ensuing year.

JOSEPH KELLY, Vallejo manager of PG and E, retired Oct. 1, after 18 years with the company. Kelly left the engineering department of the U. S. Navy with a rank of lieutenant to enter PG and E services. Louis N. Pechette, superintendent of the gas department of the Vallejo district for the past 20 years, will succeed him.

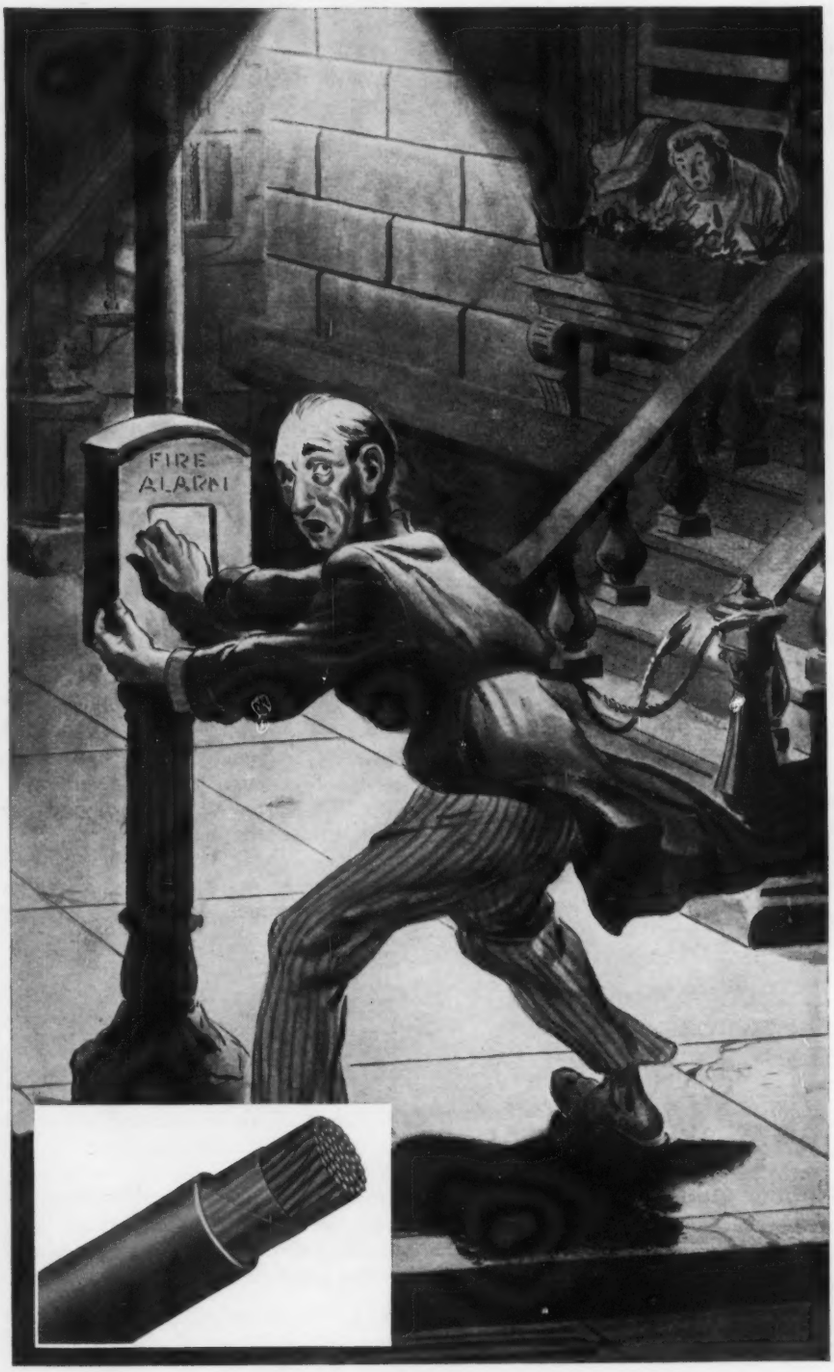
G.C.A.
Lamp Replacers
Lamp Base Removers
Cartridge Fuse Tongs
Switch Hooks
Send for Catalogue
We have been making safety tools for 24 years
THE G. C. A. Manufacturing Co.
Pittsfield, Mass.

ELECTRICAL TESTING LABORATORIES
Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.
2 East End Ave. New York

TORK CLOCKS

NEW ELECTRICALLY DRIVEN 1939 MODELS NOW AVAILABLE
WITH PLAIN OR ASTRONOMIC DIALS
Whenever it is desired to turn Current on and off Regularly there is a new model Tork Clock that can do it.
THE TORK CLOCK CO., Inc.
MOUNT VERNON, N. Y.
Representatives:
A. R. Slimmon, 445 E. 3d St., Los Angeles
Nicholas & Cook, 1063 Howard St., S. F.
H. M. Sayers, 1019 Eastlake Ave., Seattle
Stevens Sales Co., 41 P. O. Place, Salt Lake City

From Fire Alarm Cable to



WEATHERPROOF

OVER 60 TYPES OF ROEBLING ELECTRICAL WIRES AND CABLES

Rubber Covered Wires and Cables: Code; Performance; and Heat Resisting; Plain Rubber 60% sheath Power Cable and 40% and 60% sheath Flexible Cords

Power Cables: Paper; Cambric; Rubber

Parkway Cable,
metallic and non-metallic

Service Entrance Cable

Slow-Burning Wires and Cable

Weatherproof Wires and Cable

Police-Fire Alarm Cable

Appliance Cords

Annunciator and Blasting Wire

Network Cables

Magnet Wire

Welding Cables

And a wide variety of other wires and cables; either Standard or to Customer's Specifications

QUICK SHIPMENT

Prompt Service is available at all offices and warehouse points listed below, where large stocks of a wide variety of standard Roebling Wires and Cables are always on hand. Your request for information, prices or samples will be welcomed.

JOHN A. ROEBLING'S SONS CO. OF CALIF.
San Francisco, Los Angeles, Seattle, Portland

IF IT'S ELECTRICAL WIRE OR CABLE **ROEBLING** HAS IT!

South. Calif. Edison Promotes Five in Operating Department

Recent changes in the supervisory personnel of the operating department of the Southern California Edison Co., following the retirement on July 1 of Fred G. Hamilton, veteran manager of operation, are as follows:

R. G. Boyles, former assistant manager of operation, becomes manager of operation, succeeding Hamilton who retired after 40 years of Edison service.

B. D. Haugh, former superintendent of stores and offices, has been named general superintendent of distribution. He also directs the stores and tests divisions. This is a new position in the Edison organization.

Glen H. Luther, former superintendent of the Alhambra division, now is assistant superintendent of distribution.

C. M. Cavner, former assistant superintendent of substations, now is superintendent of substations succeeding L. L. Dyer, who retired after 37 years of service.

R. N. Coe, former assistant superintendent of underground, now is superintendent of underground, succeeding Clayton E. Biggs, who retired after 42 years of Edison service.

EDWARD H. GROB, formerly assistant superintendent of the Hubbard plant at Oakland, has been appointed superintendent, succeeding the late Mr. Charles Braun. Frank R. Pinson has been promoted to Grob's former position. He has been with Hubbard since 1925.

L. M. DUNCAN has succeeded the late C. Drathman as electrical inspector at Redwood City, Calif.

URBAN N. HALLIDAY has been appointed sales representative of the Pacific Electric Mfg. Corp. for the Denver, Colo., territory, according to Henry L. Brooke, sales manager of this San Francisco concern with representatives in other principal cities.

Halliday has previously worked for the company in similar capacities in Portland and Phoenix. During the last few years he has been a sales engineer at the factory.

The Company also announces the new address of their Denver representative at 230 U. S. National Bank Building, Denver, Colo.

HAROLD L. VAUGHN, Mountain States Machinery Co., Denver, is now Colorado representative for Cutler-Hammer, Inc.

C. W. SWARD, sales manager of G & W Electric Specialty Co., Chicago, made a tour of the Pacific Coast last month, and while here visited C. E. Ingalls, San Francisco, distributor for the company.

W. H. HOLCOMB has been named vice-president and general manager of the Pelton Water Wheel Co., according to E. M. Breed, president. Holcomb was formerly a vice-president and sales manager. Glenn S. Crawford has been selected to take Holcomb's place as sales manager.

FRANK ANDREWS, owner of the Andrews Magneto & Motor Works in Modesto, Calif., has a family that is following in his footsteps. Frank Andrews, Jr., has just started a motor shop in Turlock under the name, Electric Motor Service. Don Andrews has likewise opened a shop of his own in Sonora, the Tuolumne Motor & Electrical Works.

Deaths

CHARLES E. BRAUN, 42, superintendent, Hubbard & Co., Oakland, died Oct. 1. Mr. Braun had been with Hubbard for 27 years. Since 1914, he was superintendent of their Oakland plant, and before that superintendent of the Pittsburgh, Pa. plant. He was active in the Pacific Coast Electrical Assn. and was well known in the trade as he handled special sales work in addition to his plant duties.

W. K. VANDERPOEL, vice-president and executive engineer of the Okonite Co., died suddenly in New York City Oct. 21. He was well known to a host of utility executives and engineers in the far West because of his frequent trips to this region. He had been with Okonite since 1926, having come with the organization from the Public Service Co. of New Jersey.

★ *For Quick Service on Quality Products from Local Stocks*

Get in Touch with: **GEO. E. HONN CO.**

420 MARKET ST. SAN FRANCISCO, CAL.

MANUFACTURER'S REPRESENTATIVE FOR:

PYREX INSULATORS, POWER AND RADIO — Corning Glass Works
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CAPACITATORS — Cornell-Dubilier Corp.
TRANSFORMERS, POWER AND DISTRIBUTION — Gardner Electric Manufacturing Co.
CURRENT TRANSFORMERS, NIAGARA AIR INSULATED — Lee Skipwith Company
CABLE GRIPS — Kellems Products, Inc.
CONNECTORS, GROUND ROD CLAMPS, UTILITY HOIST — Jasper Blackburn Products Corp.
GUY WIRE PROTECTORS, CONE ANCHORS, EARTH AUGERS — The Specialty Device Co.
GROUND LINE POLE AND GREEN WOOD TREATMENT — Osmose Wood Preserving Company
TONG TEST AMMETERS—LOW VOLTAGE GENERATORS — Columbia Electric Mfg. Co.
UNDERGROUND CABLE TOOLS & EQUIPMENT — T. J. Cope, Inc.
TREE TRIMMING EQUIPMENT
TREE SURGEONS' TOOLS — Bartlett Manufacturing Co.
FRICTION AND RUBBER TAPES — Clifton Manufacturing Co.
METER JEWELS — Herman D. Steel Company
SAFETY LINE TOOLS — Burnham Line Tool Company

Stocks at San Francisco
Electrical Specialty Co., Inc.,
316 Eleventh Street

Stocks at Los Angeles
Electrical Specialty Co. of So. Calif.,
451 South San Pedro Street

Stocks at Seattle
Electrical Specialty Co., Inc.,
714 Fourth Avenue

For the Coast Trade

At your doorstep you now have an adequate stock of popular D-H alloys, wires, ribbons, rods and other forms.

Driver-Harris Company
Harrison, N. J.

TRADE MARK REG. U.S. PAT. OFF.
Nichrome

60,000 ITEMS FOR EVERY ELECTRICAL NEED

Your Graybar salesman brings to you a single source of *all* the electrical products you are likely to need . . . whatever that need may be.

Electrical buyers of all kinds . . . utility and industrial buyers . . . electrical contractors . . . electrical dealers . . . will find their needs anticipated by Graybar's 60,000 item service of electrical supply.

A nearby Graybar warehouse speeds up delivery of electrical products to you . . . helps you save on stockkeeping . . . brings you *what* you want, *when* and *where* you want it. Experienced Graybar men are always glad to help simplify your purchasing problems.

And behind every product from Graybar stands Graybar's 70 year reputation for satisfying the customer.

IN 1869 GRAY & BARTON
70th ANNIVERSARY
GraybaR
ELECTRIC COMPANY
IN 1939 GRAYBAR

OFFICES IN 83 PRINCIPAL CITIES • EXECUTIVE OFFICES, GRAYBAR BLDG., N. Y.

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PROFILES OF THE MONTH

J. P. Carson, formerly sales manager in the Graybar Los Angeles district, has been named successor to Al Nicoll in San Francisco, who has been shifted to Graybar's New York office

Art Schanuel, Adequate Wiring Bureau and Austin Dunham, Anaconda Wire & Cable Co., Denver, take time off to enjoy mountain scenery at the Rocky Mt. Electrical League convention

Charles E. Wilson, executive vice president of General Electric Co., came to the Pacific Coast last month, where he was an honored guest and speaker at the G-E Day at the San Francisco Fair, Oct. 7. Wilson also spoke before the San Francisco Electrical Development League at their weekly luncheon

Howard L. Scaife (left) has been appointed Hotpoint representative in the Hawaiian Islands, for the Hawaiian Electric Co. Scaife was formerly with Hotpoint in Chicago. Up at Seattle, J. C. Platt, Seattle district manager for Hotpoint, led his sales organization to triumph in the recent Hotpoint Cash-In Range campaign, competing for the Turnbull Trophy Cup ending Sept. 9

Preview of coming campaigns by

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

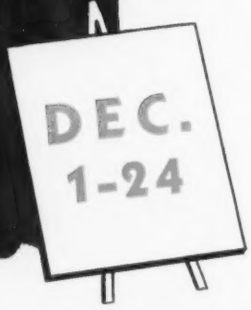
ELECTRIC APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

COMMANDS MORE SERVANTS THAN ALADDIN'S LAMP

ELECTRIC APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

GET READY FOR NEXT MONTH'S

ELECTRICAL CHRISTMAS GIFT CAMPAIGN



Once again the Electric Appliance Society presents a campaign which truly represents the entire industry—shops and stores of every size, distributors, manufacturers and utility. The campaign starts on December 1 with the distribution of dealer sales-aids—colorful 20x30-inch window cards, smaller replicas for the counter, and other material yet to be decided.

Newspaper advertising will be supplied by P.G. and E. and will run in 237 papers. The first ad will run the week of December 11; the second the week of the 18th.

Both advertisements will sell the beauty and utility of electrical gifts and will be ideal foundations for pages and whole sections of dealer tie-ins.

Watch for complete details in the next Electric Appliance Society Bulletin.

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Electric Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Electric Appliance Society, 1355 Market St., San Francisco, Calif.

EW 111-1139

The electrical industry has a market problem, too—the problem of inadequate home wiring. Inadequate wiring lowers the contractor's profits, and limits the market of the utility and the electrical dealer. Appliance sales are lost because the home-owner does not have the facilities to use them, and the home-owner loses the benefit of the rate reductions earned by a more extensive use of electricity. We can create the maximum market for the entire electrical industry only by promoting adequate wiring and more outlets for every home.

11-39

PACIFIC COAST *Electrical* BUREAU

447 SUTTER STREET, SAN FRANCISCO • 601 WEST 5TH STREET, LOS ANGELES